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DISCOVERY, ORIGIN, AND CURRENT DISTRIBUTION OF THE PURPLE SWAMPHEN (*PORPHYRIO PORPHYRIO*) IN FLORIDA

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Abstract.—The Purple Swamphen (*Porphyrio porphyrio*) is one of the most recently reported exotic bird species in Florida. Swamphens were noticed first at Pembroke Pines, Broward County, in December 1996. In February 1999, their population numbered at least 135 individuals, including one road-killed specimen donated to Archbold Biological Station. Breeding has been documented by numerous observations of downy chicks, and a nest with five eggs was discovered in July 1999. Swamphens are believed to be restricted to five artificial wetlands in two adjacent developments in Pembroke Pines. The origin of the birds was traced to local aviculturists who allowed their captive birds to roam freely. We present information on interactions between swamphens and other birds, and discuss the potential effects of Purple Swamphens becoming established in Florida.

Robertson and Woolfenden (1992) listed 146 species of exotic birds reported in Florida through December 1991, a number that continues to increase (e.g., 173 species listed *in* Pranty 1996). One of the most recent additions to Florida's exotic avifauna is the Purple Swamphen (Fig. 1; *Porphyrio porphyrio*), which was discovered at Pembroke Pines, Broward County, Florida in 1996 (Pranty and Schnitzius 1998).

The Purple Swamphen is a highly variable species that inhabits Europe, Africa, Asia, Australia, New Zealand, and other islands in the Pacific Ocean (Ripley 1977, del Hoyo et al. 1996, Sangster 1998). Swamphens are large rallids that resemble Purple Gallinules (*Por-*

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Figure 1. Adult Purple Swamphen at Pembroke Pines, Florida. Photographed by Bill Pranty, 9 October 1998.

phyrula martinica) in shape and color (especially the races *P. p. madagascariensis*, *poliocephalus* and *viridus*). However, swamphens have body lengths about 50% larger and wingspans nearly twice as long as those of gallinules (45-50 and 90-100 cm vs. 30-36 and 50-55 cm, respectively; Beaman and Madge 1998). Purple Swamphens have large red bills and frontal shields, red irides, orange legs and toes, usually with blackish areas at the heel and toe joints, white undertail coverts, and bodies that are pale blue, brilliant blue, purplish, or blackish. Australian birds are darkest, with blackish wings and backs, Phillipine birds are the palest and have rusty backs, and African birds have greenish backs. Juvenal plumage likewise varies, but is characterized by dull plumage and a dusky bill and frontal shield (del Hoyo et al. 1996, Beaman and Madge 1998).

A survey of the Pembroke Pines area for Purple Swamphens in October 1998 indicated a sizeable breeding population. We hypothesized that the source of the birds was Miami MetroZoo, which had lost eight swamphens following Hurricane *Andrew* in August 1992 (P. Bermudez

pers. comm.). A photograph taken in October 1998 by Pranty (*in* Baicich 1999) shows three adult swamphens. Here, we more fully describe the status and current distribution of the species in Florida, and describe its origin from captive birds.

METHODS

The first Purple Swamphens observed in Pembroke Pines, Broward County, Florida were located in the SilverLakes development. Informal surveys of parts of the main lake in SilverLakes (hereafter, Lake A) were conducted by Kevin and Kim Schnitzius on 26 July and 2 August 1998. We conducted formal surveys of the Schnitzius' yard and the entire northern and eastern shorelines of Lake A on 9 October 1998, 21-22 February 1999, 25 July 1999, and 16 November 1999. The formal surveys of the northern and eastern shorelines of Lake A were about 3.0 km in length and required about 90 min to complete. During the February and July 1999 surveys, we also searched for swamphens in other areas near the original observations. Swamphens were observed as they rested or foraged in marshy areas 0-200 m from the shorelines of wetlands. Most of the swamphens were unwary and allowed approach to within 10-15 m before running or flying away. We recorded on maps the numbers and locations of all swamphens encountered. Following del Hoyo et al. (1996) and Beaman and Madge (1998), we aged swamphens by plumage characteristics. Birds with bright plumage and red bills and frontal shields were called adults. Birds with dull plumage and dusky bills and shields were called juveniles, and flightless young in black downy plumage were called chicks.

RESULTS

The Purple Swamphens were discovered by Kim and Kevin Schnitzius in December 1996. SilverLakes is a 1000-ha medium-density development less than 4 km east of US Highway 27 in south-central Broward County (Fig. 2). Prior to development, the area was part of the Everglades, and was mined for limerock beginning in the late 1970s. During the development of SilverLakes, which began in 1990, shallow lakes were created onsite for wetlands mitigation. Wetlands account for 124 ha (12%) of the development (D. Neuerman pers. comm.). The shorelines of these wetlands, as well as the shorelines of small islands in the lakes, have been planted with native trees such as cypress (*Taxodium* spp.), red maple (*Acer ruber*), slash pine (*Pinus elliottii*), and cocoplum (*Chrysobalanus icaco*). The marshy areas of the lakes have been planted with native wetland forbs such as horsetail (*Equisetum* spp.), arrowhead (*Saggittaria latifolia*), pickerelweed (*Pontedaria cordata*), and water lilies (*Nymphaea* spp.). The herbicide *Rodeo* is used in the SilverLakes wetlands to control exotic vegetation (S. Mazarrela pers. comm.).

East of SilverLakes is the Pembroke Isles development, which contains at least one artificial wetland. This wetland is densely covered with forbs, including patches of cattail (*Typha* spp.), and with very little open water present. North of SilverLakes is Rolling Oaks, a low-density "semi-rural" development where residents own horses, goats, and other animals, including several collections of exotic and native

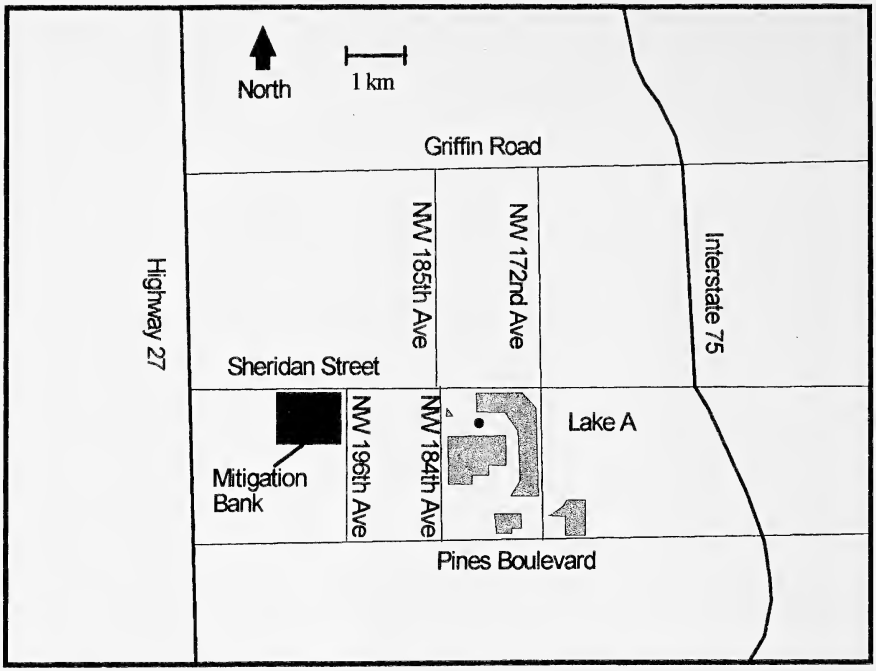

Figure 2. Map of the Pembroke Pines area. The five wetlands that contain swamphens are shown (shaded areas), as is the Pembroke Pines Mitigation Bank (solid area). SilverLakes is south of Sheridan Street between NW 196th Avenue and NW 172nd Avenue; Pembroke Isles is to the east. Rolling Oaks is bounded by Griffin Road, NW 172nd Avenue, Sheridan Street, and NW 185th Avenue. The Everglades are west of US Highway 27. The small black dot represents the location of the Schnitzius' yard.

waterfowl and other birds. Acting on information from Wally George (in litt.), we searched the Rolling Oaks development for captive waterfowl collections that might have been the source of the Purple Swamphens at SilverLakes.

Just west of SilverLakes is the 180-ha Pembroke Pines Mitigation Bank, which is being restored to wetlands to mitigate current and future development in Broward County (L. Bishop pers. comm.). Nearly all other "open" lands in the area are experiencing rapid medium- and high-density development. West of US Highway 27, extensive sawgrass (*Cladium jamaicensis*) marshes are protected as Water Conservation Area 3, although areas immediately west of the highway are composed of dense forests of Australian punk trees (*Melaleuca quinquinervia*).

In 1997, one family of swamphens, consisting of two adults and three juveniles, was living in a small marshy "conservation area" that abuts the Schnitzius' backyard in SilverLakes. The marshy area is part

of Lake A. Three of these swamphens disappeared during the winter of 1997-1998, leaving two birds. The juveniles had attained adult plumage by the time the three birds disappeared, so it was not possible to determine whether the two that remained were the breeding pair from 1997.

By April 1998 only one adult swamphen was seen, but on 16 May a second adult reappeared accompanied by four chicks. By mid-July the four chicks, now juveniles, were about the size of their parents. They were feeding on their own and were beginning to develop the red bill and frontal shield of adult plumage. By 2 August 1998 only one swamphen remained in the Schnitzius' yard; we suspect the juveniles had dispersed. On 26 August a second adult again appeared in the Schnitzius' yard with another brood, this time of three chicks. We believe this indicates double-brooding for the pair in the Schnitzius' yard.

On 26 July 1998 Kevin and Kim Schnitzius informally surveyed the northern shoreline of Lake A and counted 22 swamphens (18 adults, 1 juvenile, and 3 chicks), plus the family of 6 birds in their yard. In another informal survey on 2 August, they counted 24 swamphens (21 adults and 3 chicks) along the lake's north shore, plus the family of 5 birds in their yard. On 9 October 1998 we formally surveyed the northern and eastern shorelines of Lake A. We counted 80 Purple Swamphens, 32 along the northern shore of the lake and 48 along the eastern shore. The Schnitzius' yard contained the family of four birds. Of these 84 swamphens, 59 were adults, 16 were juveniles, 1 was a large chick, and the ages of 8 birds were not determined. During subsequent informal surveys in 1998, swamphens were found elsewhere in SilverLakes and near the northeast corner of NW 172nd Avenue and Pines Boulevard in Pembroke Isles.

On 20 February 1999 we found the remains of an adult swamphen that had been run over on Sheridan Street between Lake A and Rolling Oaks. Although damaged heavily, the specimen was salvaged and was donated to Archbold Biological Station (uncatalogued, G. Woolfenden, in litt.). This represents the first specimen obtained in North America.

On 21-22 February 1999 we conducted a second formal survey of the northern and eastern shorelines of Lake A and the Schnitzius' yard, as well as all other areas where swamphens had been observed previously. We also searched other areas of SilverLakes and adjacent developments for "new" swamphens, but we did not find any. We counted 134 swamphens: 131 adults, 1 juvenile, and 2 chicks. Nearly all (n = 114; 85%) of the birds were found in areas that were surveyed on 9 October 1998. One of these swamphens was found in the canal between Rolling Oaks and Sheridan Street, and the remaining 20 birds were found in areas discovered after the October survey.

On 25 July 1999 we resurveyed all areas visited during the February 1999 survey. We counted 95 swamphens: 85 adults, 7 chicks, and 3 birds of undetermined age. One of the adults was found incubating a

clutch of five eggs (Fig. 3) and another was observed carrying apparent nesting material more than 50 m through marsh vegetation. We surveyed the wetlands along the east side of the Pembroke Pines Mitigation Bank for swamphens, but otherwise did not search any other additional areas for "new" birds. On 16 November 1999 a fourth survey of the northern and eastern shorelines of Lake A was conducted, but only one other area (the lake at Pembroke Isles) was surveyed. Table 1 summarizes the results of the swamphen surveys in October 1998 and February, July, and November 1999.

All but one of the swamphens we have observed have been found in the shallow artificial wetlands in SilverLakes and Pembroke Isles. The single exception was an adult swamphen found in the canal along the north side of Sheridan Street (i.e., the southern boundary of Rolling Oaks). The banks of this canal are steep and overgrown in places with shrubs and trees. The canal is 4-8 m wide (depending on recent rainfall) and the surface is covered with algae but lacks other aquatic vegetation. We suspect the bird found here was using the canal as a corridor to move from one place to another. We doubt that the canal, or others like it, could sustain swamphens for an extended period.

The current range of the Purple Swamphen in Pembroke Pines, Florida, is apparently bounded by Sheridan Street to the north, 600 m to the east of NW 172nd Avenue, Pines Boulevard to the south, and NW

Figure 3. First documented Purple Swamphen nest in North America, at Pembroke Pines, Florida, 25 July 1999. Photographed by Bill Pranty.

Table 1. Results of four Purple Swamphen surveys (one incomplete) at Pembroke Pines, Florida.

Date	Schnitzius' yard	Sheridan St.[1]	NW 172nd Ave.[2]	Other[3]	Totals
9 Oct 1998	4	32	48	—	84
21-22 Feb 1999	5	29[4]	80	20	134[4]
25 Jul 1999	3	22	41	29	95
16 Nov 1999	3	14	33	9[5]	59[6]

[1]The northern shoreline of Lake A along the south side of Sheridan Street between NW 184th and NW 172nd avenues, and the canal along the north side of Sheridan Street opposite Lake A.

[2]The eastern shoreline of Lake A along the west side of NW 172nd Avenue between Sheridan and NW 9th streets.

[3]The western shoreline of Lake A, the lake along the east side of NW 184th Avenue between NW 9th and NW 17th streets, the small lake at the northeast corner of NW 184th Avenue and NW 17th Street, the western shoreline of the lake north of Pines Boulevard between NW 178th Avenue and NW 172nd Avenue, and the lake in Pembroke Isles at the northeast corner of Pines Boulevard and NW 168th Avenue.

[4]Excludes the road-killed specimen salvaged on 20 Feb 1999.

[5]16 Nov 1999 survey limited to the lake in Pembroke Isles.

[6]Incomplete survey.

184th Avenue to the west. Excluding the canal between Rolling Oaks and Sheridan Street, swamphens occur currently in five wetlands in Pembroke Pines, all of them artificial.

On 22 February 1999 we located two aviculturists in Rolling Oaks who maintain or maintained captive Purple Swamphens in their collections. These collections are just 600 m north of Lake A. One aviculturist has owned up to 12 breeding pairs of swamphens since 1992, and none of his birds are pinioned (H. Sardou pers. comm.). The other aviculturist owned one breeding pair of Purple Swamphens from 1992-1998, and those birds also were not pinioned (D. Mhoon pers. comm.). We now believe that one or both of these aviculturists are the source of the birds found at SilverLakes, and we discount our earlier hypothesis (Pranty and Schnitzius 1998) that the birds originated from Miami MetroZoo.

Foraging behavior and food items taken.—We have observed swamphens foraging mostly on horsetail stalks, which are pulled up and swallowed whole, or nipped off in pieces. Occasionally, swamphens pull entire horsetail plants out of the water and consume the tubers. Birds in the Schnitzius' yard feed also on bird seed, grass blades, and various human food items offered to them (e.g., peas, melon rinds, and cooked pasta). During spring and summer 1999, we often observed swamphens feeding on worms (apparently earthworms), but have not yet observed swamphens consuming other animal prey.

Interactions with other species.—In their yard Kevin and Kim Schnitzius have observed interactions between swamphens and three other bird species. When bird seed is scattered on the ground, several species rush in to feed. On a few occasions during these "feeding frenzies," Purple Swamphens have been observed to push away and peck at Muscovy Ducks (*Cairina moschata*). On another occasion a swamphen ended a battle between two American Coots (*Fulica americana*) by striking the coots with one of its feet. And on 29 March 1999 a Great Blue Heron (*Ardea herodias*) was observed picking up a small swamphen chick and flying off with it in its bill.

Outside of the Schnitzius' yard, we have observed no interactions between swamphens and other species. Although the wetlands occupied by the swamphens are artificial, they support a diverse variety of wetland bird species. Pranty has observed 34 species of native aquatic birds in Lake A. Breeding species include the Pied-billed Grebe (*Podilymbus podiceps*), Least Bittern (*Ixobrychus exilis*), Mottled Duck (*Anas fulvigula*), Purple Gallinule, and Common Moorhen (*Gallinula chloropus*). Non-breeding species include the American Bittern (*Botaurus lentiginosus*), Wood Stork (*Mycteria americana*), White (*Eudocimus albus*) and Glossy (*Plegadis falcinellus*) ibises, Black-bellied Whistling-Duck (*Dendrocygna autumnalis*), Blue-winged Teal (*Anas discors*), Sora (*Porzana carolinus*), American Coot, Limpkin (*Aramus guarauna*), and Common Snipe (*Gallinago gallinago*).

Discussion

In recent years, between 13 and 24 races of the Purple Swamphen have been recognized, and some authors have recognized three or more allospecies (references *in* Sangster 1998). Roselaar (*in* Cramp and Simmons 1980) identified six racial groups that Sangster (1998) suggests are distinct allospecies, based on the morphometric and mitochondrial DNA data of Trewick (1996, 1997). These proposed species are the Western Swamphen (*P. porphyrio*) of the Mediterranean region, African Swamphen (*P. madagascariensis*) of Africa, Gray-headed Swamphen (*P. poliocephalus*) of Turkey and the Caspian Sea east to southern Asia, Black-backed Swamphen (*P. indicus*) of mainland Southeast Asia and Sumatra, Java, and Borneo, Philippine Swamphen (*P. pulverulentus*) of the Philippines, and Australian Swamphen (*P. melanotus*) of Australia, New Zealand, Indonesia, and the western Pacific (Sangster 1998).

On the basis of their pale heads and bluish or purplish backs, the majority of the swamphens at Pembroke Pines appear to be *P. [p.] poliocephalus*. However, a few birds appear to have heads that are bluish-purple with no indication of gray coloration (P. W. Smith pers. comm.;

pers. obs.), and these swamphens may be of another race. The breeding pair of one of the aviculturists in Rolling Oaks was composed of a gray-headed male and a blue-headed female (D. Mhoon pers. comm.). This pair produced numerous young that disappeared from the aviculturist's yard. Because the breeding female later was killed by a dog, it was presumed that all the birds that disappeared had been similarly depredated (D. Mhoon pers. comm.). However, if any of these possible "hybrid" swamphens escaped from captivity and comprise part of the feral population at SilverLakes, they might account for the apparent plumage differences present. Additional specimens from the Pembroke Pines population are needed to sort out the question of racial, or specific, identification. (The bird donated to Archbold Biological Station has not yet been prepared as a specimen, G. Woolfenden pers. comm.).

Previous North American reports.—Although the Pembroke Pines birds are the first Purple Swamphens reported in Florida (Robertson and Woolfenden 1992, Stevenson and Anderson 1994), there is a previous report for North America. For two weeks beginning on 5 December 1990, a molting sub-adult swamphen "from one of the Middle Eastern subspecies"—apparently a gray-headed Purple Swamphen—was observed and photographed at Wilmington, Delaware. The origin of this bird was not determined (Boyle et al. 1991, AOU 1998).

Potential for establishment.—Swamphen chicks have been observed at Pembroke Pines in May, August, and October 1998, and January, February, March, April, and July 1999 (P. W. Smith pers. comm., pers. obs.). It seems likely that some of the Pembroke Pines swamphens may breed year-round. The pair in the Schnitzius' yard apparently produced two broods in 1998, and the captive birds that presumably are the source of the feral population produced two or three broods annually (D. Mhoon pers. comm., H. Sardou pers. comm.).

With their high reproductive potential and the abundance of wetlands in Florida, it seems reasonable to consider the potential negative effects of Purple Swamphens on native species or habitats if they expand their range outside of suburban Pembroke Pines. But there is no similar avian precedent available in Florida—or North America—to compare to Purple Swamphens. The only other exotic rallid that has been reported in Florida is the Gray-necked Wood-Rail (*Aramides cajanea*), which was reported to breed in Indian River and Miami-Dade counties from the 1960s to the 1970s (Stevenson and Anderson 1994) or the 1980s (Robertson and Woolfenden 1992), but then apparently died out. There is no information available about the population size of the wood-rail in Florida (Robertson and Woolfenden 1992, Stevenson and Anderson 1994), but it apparently was quite small.

Although the foraging and habitat requirements of the Purple Swamphen overlap to some extent with those of the Purple Gallinule (R.

West *in litt.*), it is our impression that swamphens prefer "grassy" shoreline vegetation rather than the emergent vegetation most preferred by gallinules. Furthermore, since all the wetlands currently occupied by swamphens are artificially maintained horsetail/arrowhead/pickerelweed marshes that lack other, much more common and widespread wetland plants (e.g., cattail and sawgrass), swamphens seem less likely to colonize native wetlands such as the Everglades. Horsetail is not listed as a dominant plant species among the various marsh habitats found in Florida (Kushlan 1990). In their native range, swamphens are often observed away from wetlands and can damage grain and vegetable crops (Ripley 1977, del Hoyo et al. 1996), so the impact of swamphens in Florida may extend beyond wetland species. Although they are primarily vegetarians, swamphens are known to prey upon mollusks, fish, lizards, frogs, snakes, bird eggs and nestlings, and other small birds (Ripley 1977, Cramp and Simmons 1980). Purple Swamphens occasionally move long distances (up to 1000 km; Grussu 1999), thus they potentially could colonize a large part of the state.

Less than half of the exotic birds reported in Florida have bred in the wild (Robertson and Woolfenden 1992, Stevenson and Anderson 1994), and of the breeding species, very few can be considered truly successful in establishing a large and increasing population. The most widespread exotic birds in Florida currently are the Muscovy Duck, Rock Dove (*Columba livia*), Eurasian Collared-Dove (*Streptopelia decaocto*), Monk Parakeet (*Myiopsitta monachus*), European Starling (*Sturnus vulgaris*), and House Sparrow (*Passer domesticus*).

Of all the exotic birds in Florida, only the European Starling often occurs in native habitats little disturbed by man. All other exotic birds in Florida appear to be dependent on one or more aspects of human development (e.g., creation of nesting sites, supplementation of food, or elimination of many potential competitors) to thrive. Extensive human development eradicates habitats for most of Florida's native breeding species, and thus may allow exotic birds to form, and in a few cases, to maintain, breeding populations. But outside of these artificial habitats, exotic birds in Florida, with the possible exception of the European Starling, have not yet shown an ability to reproduce widely. At the present time, it is premature to consider the Purple Swamphen a threat to Florida's native wetlands and avifauna.

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THE BREEDING STATUS OF CASPIAN TERNS IN THE SOUTHEASTERN UNITED STATES (MISSISSIPPI TO VIRGINIA)

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Abstract.—Caspian Terns (*Sterna caspia*) have expanded their breeding range in the southeastern United States (Mississippi to Virginia) since the early 1960s. Half of the first state breeding records occurred on natural sites (barrier islands), but breeding populations of Caspian Terns have significantly increased at dredge-material islands—not natural sites—since the early 1980s. Three localities in Alabama, Florida, and North Carolina accounted for 94-99% of the current (1995-1997) population in the region; Caspian Terns also colonized another site in Florida (Apalachicola) in 1996. The recent breeding range expansion of Caspian Terns in the Southeast may represent reoccupation of their former breeding range.

Caspian Terns (*Sterna caspia*) have a highly disjunct breeding distribution in North America (Clapp et al. 1983, Clapp and Buckley 1984, Cuthbert 1988, Spendelow and Patton 1988, Cuthbert and Wires 1999). Until the range expansion into the southeastern United States began in the early 1960s (Clapp et al. 1983), the nearest breeding populations occurred on the Great Lakes and the western Gulf of Mexico in Texas and Louisiana (Oberholser 1938, Clapp et al. 1983, Spendelow and Patton 1988; R. Martin *in* Purrington 1990).

The breeding status of the Caspian Tern in the southeastern United States (Mississippi to Virginia) has not been summarized since 1979 (Clapp et al. 1983), and not all information before 1980 was available to them. Furthermore, a substantial amount of new information has accumulated since 1979, particularly from Alabama, Florida, and North Carolina (Cooley 1987, Parnell et al. 1995, 1997; Paul 1996, unpubl. data; McNair and Gore 2000; R. Clay unpubl. data). The range expansion into the Southeast has occurred at both natural and man-made sites. Man-made sites were rare in the Southeast prior to construction of the Intracoastal Waterway in the 1930s and 1940s (Soots and Landin 1978).

In this paper, I summarize data on population size and review the range expansion of Caspian Terns in the southeastern United States since the 1960s. I specifically ask if Caspian Terns have used man-made islands more often than natural islands, if breeding populations are larger and have increased on dredge-material islands in contrast to populations on natural islands, and if colony site type has influenced the breeding distribution of Caspian Terns (cf., Schreiber 1978).

METHODS

I reviewed the literature including state colonial waterbird atlases and unpublished reports. I also contacted individuals who monitor colonial waterbirds in the Southeast to obtain information on the current (1995-1997) breeding status of Caspian Terns. I categorized each colony type of the Caspian Tern as natural or man-made (i.e., dredge-material island). I grouped breeding records over all years for each colony site or discrete cluster of colony sites by location: artificial sites by the major body of water each site was associated with and natural sites by barrier island (Table 1). The only exceptions were one natural site in Pamlico Sound near Ocracoke Inlet, North Carolina, and one man-made site on Little Dauphin Island, Alabama. Most surveys of colony size were made on the ground; most of these counts of nests or breeding pairs at Caspian Tern colonies were direct and complete. One ground count was an estimate only (St. George Sound, Florida). Only a few counts relied on aerial surveys which were estimates only.

I used linear regression analysis to examine trends in Caspian Tern populations at three dredge-material colony sites or cluster of colony sites. These sites are in Alabama (Gaillard Island: occupied since at least 1983; detailed censuses begun in 1988; 1994 data missing), Florida (Hillsborough Bay: occupied since at least 1974; detailed censuses began in 1980; two years of data missing), and North Carolina (Pamlico Sound near Oregon Inlet: occupied since 1972 when detailed censuses began; nine years of data missing) (Cooley 1987, Parnell et al. 1995, Paul 1996, unpubl. data; D. H. Allen unpubl. data; R. Clay unpubl. data). Data for all three localities were ground counts of nests, other than a few counts of breeding pairs in Florida. I performed the analysis on raw data, but transformed raw data to their natural logarithms to graph the results.

RESULTS

Since their regional range expansion began in the early 1960s, Caspian Terns have nested in six coastal southeastern states (Table 1). With the exception of pre-1916 nest records in Virginia (Bailey 1913, Weske et al. 1977), first state breeding records in the Southeast were from 1962-1976 (Florida-1962, Mississippi-1966, South Carolina-1970, North Carolina-1972, Virginia-1974, and Alabama-1976). The only colony site on the Atlantic coast of Florida was discovered in 1973. Caspian Terns have not nested in South Carolina since 1974, Mississippi since 1976, and the Atlantic coast of Florida since 1980 (Table 1).

Three out of six of the first state breeding records of Caspian Terns during their range expansion occurred on natural islands (McDaniel and Becket 1971, Jackson et al. 1979, Kain 1987), where Caspian Terns usually nest on flat areas just above the high tide line (McDaniel and Becket 1971; B. Williams, *in litt.*). Breeding populations at colony sites on natural islands have remained low (Table 1); the largest colony of 15 pairs occurred in Mississippi (Jackson et al. 1979).

Since the early 1960s, the number of different colony sites or cluster of colony sites on man-made islands has exceeded the number on natural islands by more than two to one, regardless of whether this comparison is based on the total number of colony sites or the total number of colony sites for each year in which nesting occurred (Table 1). From 1995-1997, all birds except a single pair in Virginia nested on

Table 1. Natural and man-made colony types, colony location and size, and count type and year of the Caspian Tern in the southeastern United States (Mississippi to Virginia) from 1962 to 1997.

State	Colony Location	Colony Size[1]	Count Type	Count Year(s)	Reference
		Natural Colony Sites			
MS	Horn Island	5 N	Ground	1966	Portnoy 1977
MS	Petit Bois Island	15 N	Ground	1967-1968	Jackson et al. 1979
SC	Cape Island	1-2 N/P	Ground	1970, 1972, 1974	McDaniel and Becket 1971, McNair and Post 1993
NC	Pamlico Sound near Ocracoke Inlet	1-2 N	Ground	1984-1987	Parnell and Shields 1990, Parnell et al. 1995
	Ocracoke Island			1989-1991, 1995	D. H. Allen and W. Golder, unpubl. data
NC	Hatteras Island: Cape Point	1 N	Ground	1986	D. A. Allen, unpubl. data
VA	Barrier Islands	0-4 N/P	Ground	1974-1997	Weske et al. 1977, Kain 1987, Spendelow and Patton 1988; B. Williams, unpubl. data
		Artificial Colony Sites (Dredge-Material Island)			
MS	Mississippi Sound: Horn Island Pass	4 Ad	Aerial	1976	Portnoy 1977
AL	Little Dauphin Island	132 Ad	Aerial	1976	Portnoy 1977; Cooley 1987
AL	Mobile Bay: Blakeley Island	340 Ad	Ground	1979	Winn and Winn 1987
AL	Mobile Bay: Gaillard Island	59-606 N	Ground	1983-1997	Cooley 1987; R. Clay, unpubl. data; see text
FL[2]	St. George Sound	4-8 N/P	Ground	1978-1979	Stevenson 1979; Stevenson and Anderson 1994
FL[2]	Apalachicola Bay	29-39 N	Ground	1996-1997	McNair and Gore 2000
FL[3]	Boca Ciega Bay	1 N	Ground	1962	Woolfenden and Meyerriecks 1963
FL[3]	Tampa Bay	1 N	Ground	1967, 1972	Rohwer 1968, Schreiber and Dinsmore 1972
FL[3]	St. Joseph Sound	1 N	Ground	1969-1970, 1972	Schreiber and Dinsmore 1972
FL[3]	Gasparilla Sound	1 N	Ground	1973, 1978	Dunstan et al. 1975, Kale 1979b
FL[3]	Charlotte Harbor	1 N	Ground	1974	Dunstan et al. 1975

Table 1. (Continued) Natural and man-made colony types, colony location and size, and count type and year of the Caspian Tern in the southeastern United States (Mississippi to Virginia) from 1962 to 1997.

State	Colony Location	Colony Size[1]	Count Type	Count Year(s)	Reference
FL[3]	Hillsborough Bay	13-93 P/N	Ground	1974-1997	Dunstan et al. 1975; Kale 1979b;Spendelow and Patton 1988; Paul 1996; R. T. Paul, unpubl. data; see text
FL[4]	Indian River Lagoon	1-10 P/N	Ground	1973-1980	Salata 1979; Kale et al. 1979a; Portnoy et al. 1981; Stevenson and Anderson 1994; McNair and Gore 2000
NC	Pamlico Sound near Oregon Inlet	1-36 N	Ground	1972-1997	Parnell and Soots 1976, 1979; Portnoy et al. 1981; Parnell and McCrimmon 1984, Parnell and Shields 1990, Parnell et al. 1986, 1995, 1997; D. H. Allen and W. Golder, unpubl. data; see text
NC	Pamlico Sound near Hatteras Inlet	1 N	Ground	1974	Parnell and Soots 1976

[1]Abbreviations are: Ad = total number of adults, N = nests, P = pairs of breeding adults.
[2]Data are from colonies located on the northern Gulf coast.
[3]Data are from colonies located on the central Gulf coast.
[4]Data are from one colony located on the central Atlantic coast.

dredge-material islands; few (4-5) colony sites were occupied in any year (Table 2).

The sizes of dredge-material islands used as colony sites by Caspian Terns have ranged from 0.1 ha to greater than 240 ha. Caspian Terns may nest both on top of the dome or dike (Parnell and Soots 1976, 1979; Stevenson 1979, Paul 1996, McNair and Gore 2000, R. Clay *in litt.*), or on less elevated portions of diked or undiked dredge-material islands (Woolfenden and Meyerriecks 1963, Dunstan et al. 1975, Paul 1996, McNair and Gore 2000). Caspian Terns have moved to the domes of dredge-material islands when vegetation grew over the lower elevations where birds nested the preceding year (McNair and Gore 2000; R. T. Paul unpubl. data).

Colony sizes have ranged from one to 606 nests (Table 1). All colonies formed before the 1980s were small (15 pairs or less), except at dredge-material islands in Alabama and Florida (Hillsborough Bay). Since the 1980s, the number of locations with small colonies has decreased compared to the earlier period (1960s-1970s: 12 locations; 1980s-1990s: 3 locations on natural islands only, all in North Carolina; colony locations which spanned both decade groups excluded). The reasons for the disappearance of all small breeding populations of Caspian Terns at dredge-material islands prior to the 1980s are rarely documented. The only breeding population on the Atlantic coast of Florida vanished because habitat became unsuitable (see McNair and Gore 2000).

The largest colonies have grown on a few dredge-material islands since the 1980s, primarily along the Gulf coast, especially at Gaillard Island in Mobile Bay, Alabama (Cooley 1987; R. Clay *in litt.*; this paper). Current (1995-1997) population estimates for breeding Caspian Terns in the Southeast range from 367-729 pairs (Table 2). The largest estimate in 1996 excludes breeding populations in North Carolina,

Table 2. Population size and number of colony sites of Caspian Tern in the southeastern United States (Mississippi to Virginia) from 1995 to 1997. No colonies occurred in Mississippi, Georgia, and South Carolina.

	Population Size[1]		
State	1995	1996	1997
Alabama	245 (1)	606 (1)	522 (1)
Florida	84 (1)	122 (2)	106 (2)
North Carolina	37 (2)	U[2]	26 (1)
Virginia	1 (1)	1(1)	0
TOTAL	367 (5)	729 (4)	654 (4)

[1]Number of colony sites are enclosed in parentheses. All colonies are on dredge-material islands except for natural estuarine islands in Virginia.
[2]U = Unknown; census not conducted.

which were not censused that year. Since the 1980s, Caspian Terns have only occupied one new man-made site, on a dredge-material island at Apalachicola, Florida (McNair and Gore 2000). This site was created in 1995 and in 1998 it was the largest Caspian Tern colony in Florida (McNair and Gore 2000).

The three most persistent populations on dredge-material islands in the Southeast all increased in size. The regression of number of breeding pairs or nests of Caspian Tern recorded by year was statistically significant (Alabama [Gaillard Island]: $F = 11.18$, adjusted $R^2 = 0.56$, $P = 0.01$; Florida [Hillsborough Bay]: $F = 51.88$, adjusted $R^2 = 0.80$, $P = 0.00001$; North Carolina [Pamlico Sound near Oregon Inlet]: $F = 21.75$, adjusted $R^2 = 0.58$, $P = 0.0003$; Fig. 1). The rate of population increase indicated each colony doubled in size about every five (Alabama) to nine years (Florida), although a notable population increase in North Carolina was delayed until the 1990s (cf., Parnell et al. 1997). These three localities accounted for 94-99% of the total population in the region from 1995-1997.

DISCUSSION

Since the breeding range expansion of Caspian Terns began in the early 1960s, dredge-material islands have apparently influenced their breeding status in the Southeast. Disappearance of breeding popula-

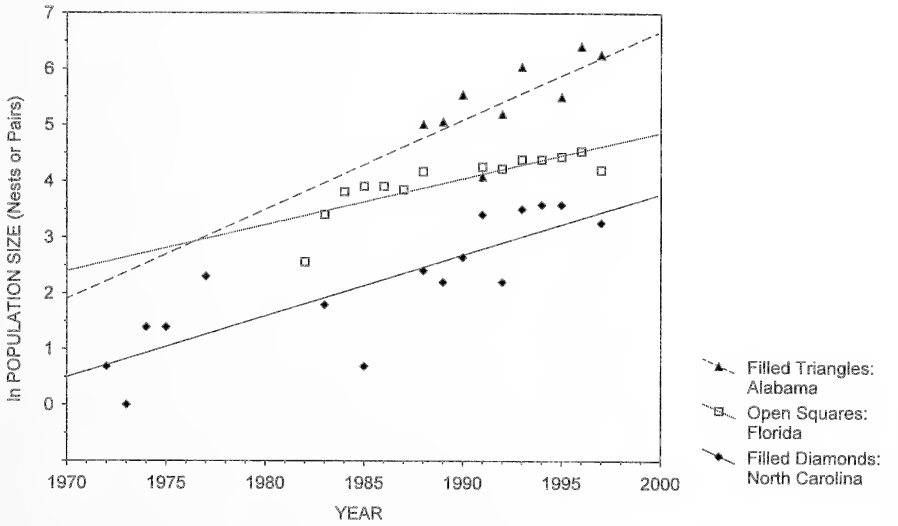

Figure 1. Regression of total number (ln) of nests or pairs of Caspian Terns by year at three colony sites or colony site complexes on dredge-material islands in the southeastern United States (Gaillard Island, Alabama, filled triangles; Hillsborough Bay, Florida, open squares, Pamlico Sound, near Oregon Inlet, North Carolina, filled diamonds).

tions of Caspian Terns from Mississippi (although see Cuthbert and Wires 1999) and South Carolina and from the Atlantic coast of Florida coincides with a general decrease in number of small colony sites since the early 1980s. The growth of breeding populations of Caspian Terns since the early 1980s at three dredge-material island colony sites or colony site complexes (Gaillard Island, Alabama; Hillsborough Bay, Florida; Pamlico Sound near Oregon Inlet, North Carolina), and now a fourth large colony at Apalachicola (McNair and Gore 2000), may be responsible for the population increase in the Southeast. In the western Gulf in Texas and Louisiana, long-established breeding populations of Caspian Terns have also become larger and increasingly restricted to dredge-material islands in contrast to their former distribution on natural sites (Bent 1921, Oberholser 1938, Clapp et al. 1983; R. Martin *in* Purrington 1990; Purrington 1994; R. P. Martin and G. D. Lester unpubl.). Thus, long-established and recently established Caspian Tern populations in the Southeast have shifted to use of dredge-material islands as colony sites. This suggests that Caspian Terns favor man-made sites although the evidence is largely circumstantial.

All dredge-material sites in Alabama, Florida, and North Carolina rely upon deposition of fresh fill to provide suitable breeding habitat (Parnell and Shields 1990, Paul 1996; Parnell et al. 1997; R. Clay *in litt.*). Deliberate habitat management for beach-nesting seabirds in addition to deposition of fresh fill is conducted at the Hillsborough Bay site in Florida (Paul 1996 *in litt.*). Nevertheless, abrupt Caspian Tern colony relocations from island to island in the Hillsborough Bay complex have occasionally occurred (R. T. Paul *in litt.*). Without regular disturbance, dredge-material islands in the Southeast remain suitable breeding habitat for Caspian Terns for about four years (Soots and Parnell 1975, Parnell and Shields 1990, Leberg et al. 1995). The number of species of beach-nesting seabirds currently breeding on dredge-material islands (e.g., Parnell et al. 1997) suggests that unused sites exist for Caspian Terns. This may indicate that Caspian Terns have specialized habitat requirements that we have not yet identified.

The near absence of breeding records of Caspian Terns in the Southeast until the 1960s, 20-30 years after dredge-material islands were readily available (Soots and Landin 1978), suggest that breeding populations from the western Gulf of Mexico and Great Lakes were not expanding. Since the 1960s, both populations have expanded (Shugart et al. 1978, Clapp et al. 1983, Spendelow and Patton 1988; Cuthbert and Wires 1999), so the origin of breeding populations of Caspian Terns in the Southeast could be from either source or both, but no direct evidence exists for either colonizing source. Although breeding populations on the Great Lakes are larger than in the western Gulf (Clapp et al. 1983, Spendelow and Patton 1988, Cuthbert and Wires 1999), Shugart et al.

(1978) argued that little mixing occurred between disjunct breeding regions, and the proximity of eastern Gulf coast colonies suggest that they were probably colonized by birds from the western Gulf (Bent 1921, Oberholser 1938, Clapp et al. 1983; R. Martin *in* Purrington 1990).

Finally, prior to the recent range expansion of Caspian Terns, a small (12 pairs or less) isolated historical population nested on natural sites prior to 1916 in Virginia: the only confirmed historical breeding population of Caspian Terns in the Southeast (Weske et al. 1977, McNair 1994a, b). This Virginia population was eliminated by humans (Weske et al. 1977). The recovery of breeding populations of many other species of larids in the Southeast after enactment of the Migratory Bird Treaty Act of 1916 when human persecution was greatly reduced included re-colonization of historical colony sites where birds had been extirpated and occupation of geographic regions where birds had probably nested before (Bent 1921, Kale et al. 1965, Sprunt and Chamberlain 1970, Clapp et al. 1983, Clapp and Buckley 1984, Robertson and Woolfenden 1992, McNair 1994b, Stevenson and Anderson 1994, Parnell et al. 1995, 1997; Thompson et al. 1997). This included Laughing Gulls (*Larus atricilla*) which is the most abundant seabird in the Southeast (Clapp and Buckley 1984). Thus, Caspian Terns may once have been more widely distributed and their recent range expansion may possibly represent reoccupation of their historical breeding range. Elimination of similar small and patchily distributed breeding populations on natural sites in the Southeast outside Virginia could have gone undetected.

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NOTES

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FIRST CERTAIN RECORD OF CALIFORNIA GULL (*LARUS CALIFORNICUS*) IN FLORIDA

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The status of California Gull (*Larus californicus*) in Florida, prior to this record, is unresolved. Robertson and Woolfenden (1992) placed California Gull on their unverified list, while Stevenson and Anderson (1994) placed it on their accredited list (see Woolfenden et al. 1996). I follow the criteria of Robertson and Woolfenden (1992). Gulls in their third winter were photographed in Pinellas County in 1978 and 1979; species identification was not considered certain although the birds probably were California Gulls (Robertson and Woolfenden 1992, Stevenson and Anderson 1994). Following the ambiguous photographs, six sight observations of California Gulls have been reported. The Florida Ornithological Society Records Committee (FOSRC) rejected two reports; two undetailed reports never reviewed by the FOSRC lack documentation (Baker 1991a, b; Stevenson and Anderson 1994); and two detailed reports (a bird seen in late October 1982 [Stevenson and Anderson 1994] and an adult in February 1983 [Powell 1986, FOSRC]) are valid, although formal documentation is lacking for each. Both valid reports occurred on the peninsula, one on Gulf coast (Pinellas County), the other on the Atlantic coast (Brevard County).

I discovered a first-winter California Gull at Apalachicola, Franklin County, on 26 September 1998, when Hurricane Georges was more than 300 km offshore. Sustained winds at Apalachicola were about 50 km. The bird was associated with a mixed flock of gulls, terns, and skimmers resting on a partially flooded vacant lot at the tip of a small peninsula at the mouth of the Apalachicola River. Large numbers of larids occur at this site during severe storms. I compared the California Gull to a first-winter Herring Gull (*L. argentatus*) and two Ring-billed Gulls (*L. delawarensis*). I approached the California Gull to within 8-10 m on numerous occasions from 0815-0915 hr. The bird rested on its breast several times, suggesting it was tired, but otherwise it appeared to be healthy. It flew short distances (< 50 m) when flushed, which afforded excellent views of its plumage, especially the wings. The bird finally flew out over the river and bay and was not seen again.

The predominantly brown California Gull appeared considerably smaller and slimmer than the Herring Gull, and somewhat larger than the Ring-billed Gulls, although photographs (Tall Timbers Research Station Photo Collection [TTRS] P17-19; TTRS P20, Fig. 1) only document its size and proportion compared to Laughing Gulls (*L. atricilla*). The proportionally slender bicolored bill of California Gull was sharply defined, the basal two-thirds to three-quarters pink, the tip blackish (TTRS P17-19; TTRS P20; Fig 1). The eye was dark, the legs and feet pale pink. The bird lacked any gray plumage. The rear crown, nape, and hindneck to the foreneck was brown streaked with white. I repeatedly observed the double-secondary bar, the anterior bar fainter, when the bird flew. A portion of the double-secondary bar was also visible on the closed wing of the sitting bird (Fig. 1). The primaries and primary coverts were entirely dark brown above and below except for a touch of white on the inner primaries, unlike first-winter Herring Gull which had large whitish patches near the wrist. The tail of California Gull was entirely dark brown and contrasted sharply with strongly barred upper- and undertail coverts. Some broken barring was present on the lower flanks. The bird was silent.

Figure 1. California Gull in first-winter plumage at Apalachicola, Franklin Co., Florida, 26 September 1998 (middle foreground of photograph; TTRS P20). See text for description. Note the relatively large size (in comparison to Laughing Gull), slender bicolored bill, and double secondary bar. Photo by D. B. McNair.

Although some first-winter Herring Gulls have bicolored bills (Harrison 1983), the small size, proportionally slender bicolored bill, and a portion of the double secondary bar indicate that the bird I observed was a first-winter California Gull. I did not observe any intermediate characters, which eliminates the possibility that the bird was a hybrid (Harrison 1983, Chase 1984). This record was unanimously accepted by the Florida Ornithological Society Records Committee (99-392).

The California Gull that I observed was present one month earlier in autumn than the other autumnal report in Florida (Stevenson and Anderson 1994), which was also a first-winter bird. The majority of juvenile California Gulls disperse from the breeding grounds soon after fledging and before adults, often arriving on their winter range (Pacific coast) in July (Winkler 1996). Most California Gull populations have been increasing (Conover 1983, Jehl et al. 1988, Paul et al. 1990, Yochem et al. 1991; J. R. Jehl unpubl.; see Winkler 1996 for an alternative explanation); therefore, it seems likely that dispersing individuals, especially immatures, have probably been overlooked during autumn in Florida. During winter in the Southeast, California Gulls have occurred regularly in coastal North Carolina (usually at Cape Hatteras) since 1993 (Tove et al. 1998) and first reported in Alabama in 1996 (Duncan 1996).

In summary, the California Gull at Apalachicola is the first certain record for Florida, and the California Gull in Florida, therefore, should be elevated to the verified list (cf., Robertson and Woolfenden 1992).

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OBSERVATION OF A MELANISTIC BOBCAT IN THE OCALA NATIONAL FOREST

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Melanism has been recorded in 13 species of wild cats and is the most common coat variant (Robinson 1978, Alderton 1993). Melanistic bobcats (*Lynx rufus*) have been documented in southern Florida (Hamilton 1941, Ulmer 1941, Paradiso 1973, Laing 1990, Regan and Maehr 1990) and New Brunswick, Canada (Tischendorf and McAlpine 1995). These accounts represent all of the known documented records of melanism in the species.

On 9 September 1990 at ca. 1900 hours while driving south on Forest Road 65 (R26E, T15S, S7) adjacent to Juniper Wilderness in the Ocala National Forest, Marion County, Florida, we observed what we thought was a large black dog standing in the middle of the road at a distance of approximately 50-75 m. When we approached to within 25 m, we discovered that the animal was a melanistic bobcat. From a distance of 10-15 m, we watched the animal limp away on three legs into a thicket of scrub oaks (*Quercus* spp.) and saw palmettos (*Serenoa repens*). After leaving the vehicle and examining the vicinity, we observed a large ca. 1.3 m long eastern diamondback rattlesnake (*Crotalus adamanteus*) coiled and rattling. It seems likely that a confrontation had occurred between the bobcat and the snake which allowed us to approach the cat at close range.

The bobcat appeared to be about three times larger than a domestic cat with a weight estimated to be ca. 11 kg. The tail of the bobcat was very short and did not appear to be as long as the tails of two melanistic bobcats described by Ulmer (1941), which were ≥18 cm. We also observed the conspicuous black ear tufts on this bobcat which are characteristic of bobcats. However, Laing (1990) described a melanistic bobcat live-trapped in Polk County, Florida, as lacking small black ear tufts. Several authors have stated that under most light conditions, melanistic bobcats appear to be entirely black but at certain angles faint spotting can be observed (Hamilton 1941, Ulmer 1941, Paradiso 1974, Laing 1990). Based on our short period of observation and low light conditions, the bobcat appeared to be entirely black in coloration and no spots were visible.

This observation increases the northern most record of a melanistic bobcat in Florida by ca. 100 km. Although melanism in bobcats may be most frequent in southern Florida (Regan and Maehr 1990), our observation together with that of Tischendorf and McAlpine (1995) documents its occurrence elsewhere in the range.

We thank Dave Maehr and Henry Smith for their comments on this note.

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THREE SOURCES OF FLORIDA GRASSHOPPER SPARROW MORTALITY

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The Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*) is an isolated sedentary subspecies endemic to dry prairies of south central Florida (Delany 1996, Vickery 1996). It was listed as endangered because of its restricted distribution and population decline caused by extensive conversion of dry prairies to unsuitable habitats, especially bahiagrass (*Paspalum notatum*) pastures (Federal Register 1986, Delany 1996). Breeding aggregations are known currently from only Avon Park Air Force Range (APAFR) in Highlands and Polk counties, Kissimmee Prairie State Preserve in Okeechobee County, and Three Lakes Wildlife Management Area in Osceola County (Delany et al. 1999). A small population at Ordway-Whittell Kissimmee Prairie Sanctuary in Okeechobee County apparently was extirpated by spring 1999 (P. Gray pers. comm.). The total population of Florida Grasshopper Sparrows likely is fewer than 1000 birds (Delany et al. 1999).

Delany et al. (1993) did not identify sources of mortality of adults at APAFR. Predators of Florida Grasshopper Sparrow eggs and nestlings identified by Nicholson (1936) were snakes, spotted (*Spilogale putorius*) and striped (*Mephitis mephitis*) skunks, and feral hogs (*Sus scrofa*). Flooding likely causes nesting failure (Vickery 1996), but is undescribed. Information identifying these and other sources of mortality are needed before Florida Grasshopper Sparrow recovery efforts can be developed fully (USFWS 1988). Here I describe three newly reported sources of Florida Grasshopper Sparrow mortality: predation by a Loggerhead Shrike (*Lanius ludovicianus*), nesting failure caused by flooding, and collision with a motor vehicle. Mortalities occurred in the 800 ha OQ Range/Delta Trail Area in the Highlands County portion of APAFR.

Shrike predation.—I discovered the remains of an adult Florida Grasshopper Sparrow impaled on a barbed-wire fence in OQ Range at 0730 hr on 22 July 1998. The remains consisted of the front part of the head, including both mandibles, the forehead, the left lower jaw, and both eyes. The head was impaled from behind, with the barb penetrating the front of the skull. Remaining feathering included pale nares, yellow lores, and a black forehead with the frontal pattern of the whitish median crown stripe. A few buffy body feathers also were attached to the barbed-wire. No remains were found on the ground below the fence. I salvaged the head and feathers (Florida Museum of Natural History UF40245).

Nest flooding.—M. Scheuerell (pers. comm.) discovered a Florida Grasshopper Sparrow nest in the Delta Trail Area at 0800 hr on 3 July 1997. The nest, built in a clump of wiregrass (*Aristida beyrichiana*) and dwarf live oak (*Quercus minima*), contained one egg and three nestlings that had just hatched. On 4 and 5 July respectively, 27 mm (1.06 in) and 29 mm (1.12 in) of rain fell 2 km west of the nest site (APAFR data). On 6 July I checked the nest at noon. No adults were observed. Habitat surrounding the nest was flooded with ≤25 mm of water; the inside of the nest cup contained 15 mm of water. Only two nestlings remained, and the waterline was close to or over their nostrils. One nestling had died recently and was salvaged (Florida Museum of Natural History, necropsy performed, carcass discarded but the stomach retained, contents uncata-

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logued, M. F. Delany pers. comm.). I placed the head of the remaining nestling, which was close to death, on the rim of the nest cup above the waterline. At 1850 the same day, the nestling was gone.

I discovered a Florida Grasshopper Sparrow nest in OQ Range at 0900 hr on 30 June 1999. The nest was built in a clump of wiregrass shielded by bluestem (*Andropogon* spp.) and contained four eggs. The four eggs were still present on 2 July. On 4 July, 68.3 mm (2.69 in) of rain fell 2.5 km west of the nest site (APAFR data). Local thunderstorms occurred on 5 July, but almost no rain was recorded at the weather station. The nest was empty at 1930 hr on 5 July, when the surrounding prairie was inundated with ≤25 mm of water. The inside of the nest cup contained 10 mm of water.

Vehicle collision.—S. Van Hook (pers. comm.) found a freshly-killed juvenile Florida Grasshopper Sparrow on Kissimmee Road about 2 km east of OQ Road at 0930 hr on 2 July 1996. Kissimmee Road is a single-lane, paved road that bisects the OQ Range/ Delta Trail Area. The maximum posted speed limit on the road is 64 kph (40 mph), but vehicle speeds appear to often exceed 80 kph (pers. obs.). The sparrow was missing its tail and had numerous broken bones and torn skin, but was salvaged (Florida Museum of Natural History UF39366).

Discussion.—Florida Grasshopper Sparrow nests are built on the ground, often at the base of grass clumps, and are concealed by grasses, forbs, or dwarf live oaks (Delany 1996, Vickery 1996, pers. obs.). The nest cup is built in a slight depression (≤3.2 cm; Delany and Linda 1998) in the sand substrate, so that the contents of the nest usually are at, or slightly below, ground level. Florida Grasshopper Sparrow egg dates range from 2 April (Stevenson and Anderson 1994) to 21 August (pers. obs.), which results in a nesting cycle that may begin in late March and may extend into early September. Flooding associated with intense rainfall events from June to August may be an important source of Florida Grasshopper Sparrow nesting failure.

Loggerhead Shrikes are rare in regularly burned, unfenced Florida dry prairies, probably because of the scarcity of suitable nesting and impaling substrates. Prairies that are burned lightly or infrequently often are invaded by oaks (e.g., *Quercus virginianus* and *Q. laurifolia*) especially along roadways and fencelines, and may then support shrikes (pers. obs.). Barbed-wire fencing may also encourage shrikes to move into prairies. Since 1996, three or four resident pairs of Loggerhead Shrikes occur in the OQ Range/Delta Trail Area, all in overgrown areas along roads and barbed-wire fencelines. Although shrikes probably pose only a small threat to sparrow populations, land managers should consider removing barbed-wire fencing and shrike nesting substrates (e.g., oaks) from prairies occupied by Florida Grasshopper Sparrows. At APAFR, T. Dean (*in* Vickery 1996) observed wintering Eastern Grasshopper Sparrows (*A. s. pratensis*) that had been impaled on barbed-wire fencing, and also observed a shrike pursuing but failing to catch a juvenile Florida Grasshopper Sparrow.

Mortality from motor vehicles may occur more frequently than has been documented within the OQ Range/Delta Trail Area Florida Grasshopper Sparrow population, but likely has only a minimal impact. All other currently known populations of sparrows are found in areas with only sand roads (pers. obs.), so vehicle mortality may not occur elsewhere.

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RECENT BREEDING OF CASPIAN TERNS IN NORTHWEST FLORIDA

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Caspian Terns (*Sterna caspia*) were first confirmed to breed in Florida in 1962 (Woolfenden and Meyerriecks 1963) and they have nested only rarely in the state since then (Stevenson and Anderson 1994, Paul 1996). Nesting has occurred annually since at least 1974 on several islands of dredged-material in Tampa Bay (Paul 1996), but elsewhere nesting last occurred on dredged-material islands near East Point, Franklin Co., in 1979 (Stevenson 1979, Stevenson and Anderson 1994) and along the Banana River, Brevard Co., in 1980 (one pair defending territory, Schroeder 1980; also see Salata 1979). Caspian Terns also reportedly bred during five consecutive years (1979-1983) in Apalachicola Bay at a diked dredged-material island (called Drake Wilson or Two-Mile island) just southwest of Apalachicola, Franklin Co. (Landin et al. 1989:121), but no confirming data were reported. We document herein a new colony site of the Caspian Tern at Apalachicola.

As part of a channel-dredging operation, an island of undiked dredged-material was created early in 1995 in Apalachicola Bay, 1 km south of the Gorrie Bridge at the mouth of the Apalachicola River. The island remained nearly barren through 1995, perhaps due to the erosion caused by three tropical cyclones that year. During late spring and summer of 1996, we found 13 species of herbaceous plants covering <5% of the 5 ha island. The diversity of species was lower than expected for an undiked dredged-material island in its second year, but the area covered by vegetation was typical of such sites (Soots and Parnell 1975). Vegetation grew primarily along the lower swale facing the nearby mainland and was dominated by 15 large patches of seaside panicum (*Panicum amarum* var *amaralum*). This grass grew rapidly in summer and by 5 August 1996 many stems were >1.5 m high and patches were up to 4 m wide.

By 1997, the island had eroded to an area of about 3.5 ha and a height of about 3 m on the bare dome. The dense vegetation on the lower and upper swales, which was dominated by seaside panicum >2 m tall, formed an ellipse around the northern half of the island. We estimated that the island was about 15% vegetated by late summer. In March of 1998, most vegetation was cleared from the island and newly-dredged material was deposited on the island. The new material enlarged the island to approximately the height and area recorded in 1995.

American Oystercatcher (*Haematopus palliatus*) and three species of seabirds (Gull-billed Tern [*S. nilotica*], Least Tern [*S. antillarum*], and Black Skimmer [*Rynchops niger*]) nested on the island in 1995. We first observed Caspian Terns nesting on the island in 1996 and they nested again in 1997 and 1998. The birds nested adjacent to Gull-billed Terns and Black Skimmers, which are frequent nesting associates of Caspian Terns in the southeastern United States (Spendelow and Patton 1988). In 1998, a small group of Royal (*S. maxima*) and Sandwich (*S. sandvicensis*) terns also nested among the Caspian Terns (McNair and Gore 1999).

In 1996, Caspian Terns nested on the north side of the island on and just above the second storm or drift ridge (see Soots and Parnell 1975) and 0.4-0.6 m above the mean high tide line. In 1997, the dense vegetation intruded on the second drift ridge and Cas-

pian Terns nested on the upper slope about 2.5 m above the tideline. In 1998 the birds nested across a wide area on the north side of the island from just above the tide line to high on the slope.

All nests were scrapes in bare sand and some were ringed by shell or driftwood. In 1996, we found four nests with eggs on 5 June and 29 active nests (in groups of 14, 10, and 5) on 29 June. Almost all nests contained eggs or nonvagile chicks on 15 July, but we also found one vagile downy young (>7-days post hatch; Dunstan et al. 1975). We counted 75-80 adults on each of these three dates. On 5 August we found 11 young of all ages and surmised that many eggs and young did not survive a severe 3-day storm in late July that flooded most of the nests. The maximum fledgling rate possible was 0.38 young/nest.

In 1997, we found four Caspian Tern nests with single eggs on May 11 and 39 nests with eggs on 5 June. On 15 July, 11 nests were still occupied; four contained eggs and the remainder held nonvagile chicks and one vagile young. On 5 August we recorded 19 juveniles and 2 large flightless young being fed by adults.

The colony increased greatly in size in 1998 and we counted 105 nests with eggs on June 1. Nests were not clearly segregated into separate groups. As late as 19 August, large chicks were still being fed by adults. This is currently the largest nesting colony of Caspian Terns in Florida, larger than the persistent colonies in Tampa Bay (R. T. Paul, pers. comm.).

In Florida all colony sites for Caspian Terns have been on dredged-material islands, which require active management to retard vegetative succession (Schreiber 1978, Paul 1996, this study). Caspian Terns select bare or sparsely vegetated substrates for nesting and do not tolerate intrusion of high, clumped vegetation on colony sites (Soots and Parnell 1975, Parnell and Soots 1976, Schreiber and Schreiber 1978, Spendelow and Patton 1988).

Nesting records from Florida suggest that Caspian Terns will use dredged-material islands only temporarily if vegetation is not controlled to provide open nesting substrate. For example, Caspian Terns abandoned nesting sites used from 1973-1980 in the Banana River Lagoon (Salata 1979, Schroeder 1980) apparently because the dredged-material islands became overgrown with vegetation (Smith and Alvear 1997). In Franklin County, Stevenson (1979) observed a dredged-material island near East Point annually for >30 years, but Caspian Terns did not use the site until new dredged-material was deposited in 1978. A small colony then nested on the highest part of the barren area for two years (Stevenson 1979, Stevenson and Anderson 1994). Despite these examples, suitable nesting substrate is not the sole determinant of nesting effort. Caspian Terns in Tampa Bay occasionally switch colony sites between years even though the dredged-material islands are actively managed to retain breeding terns (Paul 1996).

Caspian Terns will likely continue to breed in Franklin County as long as suitable nesting habitat is available. The county supports a year-round population of Caspian Terns, presumably because prime foraging habitat exists in the large estuary of Apalachicola Bay. We have counted as many as 150 Caspian Terns roosting at the Apalachicola dredged-material island during winter (29 Dec 1995). Even prior to 1996, we routinely observed Caspian Terns in the area in summer (maximum count: 38 birds on 3 July 1990). We believe that the formation of the Caspian Tern nesting colony at Apalachicola was a consequence of the presence of optimal foraging habitat, suitable nesting habitat (new dredged-material island), and an existing local population of birds.

In summary, Caspian Terns nested at a new dredged-material island near Apalachicola, Franklin County from 1996-1998. The birds nested later and lower on the island in 1996 (29 nests) than in 1997 (39 nests) and the number of nests increased greatly in 1998 (105 nests). This is currently the only breeding site for Caspian Terns in Florida outside of Tampa Bay.

Acknowledgments.—We thank G. O. Bailey, T. Calleson, and H. L. Edmiston of the Apalachicola National Estuarine Research Reserve for helping census the new breeding

seabird colony. H. L. Edmiston monitored design and construction of the island to meet permit requirements, minimize damage to the bay bottom, and provide nesting habitat. We thank R. T. Paul for reviewing a draft of this manuscript.

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FIELD OBSERVATIONS

Summer Report: June-July 1999.—The observations listed here are reports of significant birds or numbers of birds reported to the Field Observations Committee (FOC). Reports submitted to the Committee should be in the following format: species, number of individuals, age and sex of the bird(s), color morph if applicable, location (including county), date, observer(s), and significance. Reporting seasons are winter (December-February), spring (March-May), summer (June-July), and fall (August-November). Submit reports to regional compilers within two weeks after the close of each season, or to the state compiler within one month. Reports sent via e-mail are greatly preferred over those sent via regular mail. Addresses of the FOC members are found at the end of this report.

Sight-only observations are considered "reports" while only those supported by verifiable evidence (photographs, video or audio tapes, or specimens) are called "records." Species for which documentation is required by the FOS Records Committee (FOSRC) are marked with an asterisk (*). A county designation (*in italics*) accompanies the first-time listing of each site in this report. Abbreviations used are: CP = county park, EOS = end of season, MCA = marsh conservation area (managed by a Water Management District), NWR = national wildlife refuge, SP = state park, SRA = state recreation area, SRSTF = Springhill Road STF (*Leon*), STF = sewage treatment facility, and N, S, E, W, etc., for compass directions. Bold-faced species denote birds newly reported or verified in Florida.

Summary of the Summer Season

A rainy summer ended the drought that began in spring. Temperatures were above normal in most areas; Ron Smith summarized the season in Pinellas County as, "Hot, hot, hot!" Rex Rowan reported that water levels at Paynes Prairie continued to recede, but sufficient water remained to allow Black-necked Stilts to nest there again. Peggy Powell reported that Spoonbill Pond, a cattail-choked freshwater pond at Talbot Island State Park, was recently flooded with salt water, which killed most of the vegetation. As a result, a number of notable birds occurred there this summer.

FOSRC rarities reported this season were a singing Willow Flycatcher at Zellwood 27 July, a Tropical Kingbird at Fort DeSoto County Park beginning 7 July, and a Couch's/Tropical Kingbird at Gulf Breeze 14 June. The latter two species continue to be reported frequently in the state, including during the summer months. Other significant reports were a White-tailed Tropicbird off Jupiter, a Greater Flamingo at Sanibel Island, the first Black-bellied Whistling-Duck nest found in Florida, use of two former agricultural areas by large numbers of foraging Swallow-tailed Kites, a second White-tailed Kite nest this year at Three Lakes Wildlife Management Area, the Key West Quail-Dove at Cape Florida observed to 4 June, a Lesser Nighthawk at Gulf Breeze, and Florida's first nesting Dickcissels found at Zellwood in June. Also in this report is the belated news that House Finches nested at Fort Lauderdale in 1997-1998. Unless the birds were local escapees that bred, this represents a significant southward expansion of the species' breeding range in Florida.

Extensive soil, water, and tissue sampling was conducted at Zellwood this summer to determine the extent and severity of pesticide residues present in the soils. No fields will be flooded until the samples are analyzed and potential threats to birds are known. Despite the lack of water at Zellwood, Harry Robinson observed 123 species in 17 trips during June and July. Highlights were the area's first Snail Kite, Crested Caracara, Budgerigar (!), and Shiny Cowbird. Additionally, Robinson's twice-weekly trips to the former farms probably represent some of the most accurate data available for shorebird

movements in Florida during the summer months. Highlights of Harry Robinson's observations are contained within this report; researchers interested in obtaining all of his observations should contact Bill Pranty.

Commentary.—This seasonal bird report, the first of the new millennium, marks the beginning of my eighth year as state compiler of the FOS Field Observations Committee. The FOC report publishes far more Florida bird observations than does *North American Birds* or its predecessors, *Field Notes* and *American Birds*. Furthermore, the FOC report includes bird observations from throughout Florida; in contrast, *North American Birds* splits the state into two regions. The FOC has never failed to publish a report in *Florida Field Naturalist* since its inception. I am proud of what the FOS Field Observations Committee has accomplished, and I am most appreciative of my fellow compilers, past and present. I thank Jim Cox for compiling the Committee's first 10 reports, and *FFN* editors Peter Merritt, Walter Taylor, and Todd Engstrom, for their patience and advice that helped us to produce the reports. I am especially grateful to Linda Cooper and Peggy Powell, who have served on the Committee from the beginning, and who have now assisted in the publication of 39 seasonal statewide bird reports.

To improve the reliability and accuracy of bird observations published by the Committee, I am instituting two changes to the FOC report, beginning with this issue. We will no longer publish reports of rare birds unless the reports are accompanied by accurate, written documentation, or unless we trust the identification skills of the observer(s). With the recent proliferation of bird reports posted to any of four birding e-mail lists in Florida, the need to tighten quality control should be obvious. Additionally, we will publish fewer of the observations submitted to us second-hand from land management personnel. These reports never include the names of the observer(s), details of birds that are rare or out-of-season, and the county in which the observation occurred, for those sites located in two or more counties. Other practices to improve the FOC report may also be enforced as their need becomes evident.

Lastly, I intend to greatly assist those who need to search the published FOC reports for research purposes. I will soon post electronic copies all previous FOC reports onto the FOS website, which will allow rapid searching of the 200+ pages of bird observations that the Committee has generated since 1989. The Florida Ornithological Society Field Observations Committee exists to serve birders and ornithologists in the state and elsewhere. We welcome your comments to further improve the quality and usefulness of the reports we publish.

Species Accounts

Pacific Loon: 1 in winter plumage at Gulf Breeze (*Santa Rosa*) 1 Jun (B. Duncan).

Common Loon: 1 in winter plumage at Chassahowitzka WMA (*Citrus*) 22 Jun (T. Rogers, J. Kleen).

Horned Grebe: 1 in breeding plumage at Fort Walton Beach STF (*Okaloosa*) 16-25 Jun (H. King, D. Ware).

Greater Shearwater: 1 washed ashore at Vilano Beach (*St. Johns*) 10 Jun (D. Reed, specimen to Florida Museum of Natural History).

White-tailed Tropicbird: 1 less than 5 km off Jupiter (*Palm Beach*) 7 Jun, a day with strong E winds (S. Nesbitt).

American White Pelican: 12 at Zellwood (*Orange*) 5 Jun (H. Robinson); up to 83 at St. Marks NWR (*Wakulla*) 13-27 Jun (J. Dozier, M. Collins); 163 at PPM 17 Jun (P. Fellers, L. Albright); 2 at Lake Jackson (*Leon*) 7 Jul (G. Menk); 200 at Cedar Key (*Levy*) 18 Jul (R. and T. Rogers).

Brown Pelican: single immatures at Lake Region Village (*Polk*) 6 Jul and 24 Jul (B. and L. Cooper).

Magnificent Frigatebird: 2 immatures over St. Augustine (*St. Johns*) 6 Jun (R. Clark).

American Bittern: 1 at Orlando Wilderness Park (*Orange*) 6 Jun (C. Pierce, photo to FOC); 1 at Fort Drum MCA (*Indian River*) 28 Jun (S. Rowe et al.).

Least Bittern: 1 at Little Lake Jackson (*Leon*) 2 Jul (G. Menk).

Great Egret and Snowy Egret: 462 in a mixed flock at Talbot Island SP (*Duval*) 10 Jul (R. Clark).

Yellow-crowned Night-Heron: 4 fledglings (incapable of flight) at Zellwood 5 Jun (H. Robinson).

Roseate Spoonbill: 1 at Lake Pierce (*Polk*) 10 Jun (D. Pierce, S. Huxtable); 4 at Kanapaha Prairie (*Alachua*) 16 Jun (S. Schwikert); up to 3 at PPM 16 Jun-7 Jul (P. Fellers et al.); 1 at Gainesville (*Alachua*) 27 Jun (K. Patton).

Black Vulture: 2 adults and 2 juveniles at Boyd Hill Nature Park, St. Petersburg (*Pinellas*) 24 Jul (D. Goodwin); "quite a few" in S *Pinellas* this summer (*fide* R. Smith).

Greater Flamingo: 1 at J. N. "Ding" Darling NWR (*Lee*) 23 Jun (J. Rose).

Black-bellied Whistling-Duck: 15 at Bartow (*Polk*) 17 Jun (P. Fellers, L. Albright); 2 at Emeralda MCA (*Lake*) 26 Jun (*fide* J. Marburger); 12 at PPM 5 Jul (C. Geanangel, P. Timmer, L. Albright); 1 nest with 16 eggs at Three Forks MCA (*Brevard*) 7 Jul (B. Robson, B. Quinn *fide* S. Rowe) was the first nest found in Florida; up to 7 at PPSP through the season (H. Adams, M. Manetz et al.).

Muscovy Duck: 1 at Zellwood 5-12 Jun (H. Robinson).

Mottled Duck: 179 at PPM 12 Jul (P. Fellers, B. and L. Cooper); 36 at W Kendall (*Miami-Dade*) 21 Jul (J. Boyd).

Mallard: up to 10 summered at Zellwood (H. Robinson).

Blue-winged Teal: 2 at St. Marks NWR 13 Jun, and 1 there 21 Jun (both J. Dozier); 1 at PPM 7 Jul (P. Fellers); up to 3 summered at Zellwood (H. Robinson).

Northern Shoveler: 2 at St. Marks NWR 21 Jun (J. Dozier); 1 at Pensacola (*Escambia*) 23 Jun (A. Forster); 1 at PPM 7 Jul (P. Fellers).

Redhead: 1 male summered at SRSTF (G. Menk et al.).

Ring-necked Duck: 9 at Lake Jackson 20 Jun were not seen again (G. Menk).

Lesser Scaup: 2 at PPM 5 Jul (P. Timmer, C. Geanangel, L. Albright); 1 at Palm Harbor STF (*Pinellas*) 11 Jul (R. Smith); 1 male summered at SRSTF (G. Menk et al.).

Red-breasted Merganser: 2 at Zellwood to 12 Jun (H. Robinson); 1 at Huguenot Park (*Duval*) to 2 Jul (R. Clark).

Ruddy Duck: 1 at Fort Walton Beach STF 16-25 Jun (H. King, D. Ware); 5 at PPM 17 Jun (P. Fellers, L. Albright), and 1 there 12 Jul (P. Fellers, B. and L. Cooper); 1 female in molt summered at Zellwood (H. Robinson et al.); 1 female summered at SRSTF (G. Menk et al.).

Swallow-tailed Kite: 16 at Orlando Wetlands Park (*Orange*) 2 Jun (C. Pierce); 2 at Winter Haven (*Polk*) in Jul (T. Palmer); 1 at PPM 12 Jul (P. Fellers, B. and L. Cooper); birds observed almost daily at Zellwood, feeding on dragonflies, with a high count of 102 birds 20 Jul (H. Robinson et al.); as many as 200 foraging daily over former agricultural fields W of Palm Bay (*Brevard)* in late Jul (S. Rowe).

White-tailed Kite: a second nest (thought to be of a second pair of birds) at Three Lakes WMA (*Osceola*) failed in early Jul (T. Dean et al.); 1 adult at Kicco WMA (*Polk*) through the season (T. Dean); as many as 3 at St. Johns MCA (*Brevard*) and Three Forks MCA through the season (both S. Rowe).

Snail Kite: 1 female over Zellwood 16 Jul (H. Robinson).

Mississippi Kite: 1 at Crystal River State Buffer Preserve (*Citrus*) 10 Jun (A. and B. Hansen).

Bald Eagle: at least 3 summered at Zellwood (H. Robinson).

Accipiter species: 1 at W Kendall 28 Jul (J. Boyd).

Sharp-shinned Hawk: up to 2 observed at Zellwood throughout the summer (H. Robinson).

Cooper's Hawk: a nest at Gainesville hatched 3 eggs 9 May and the young fledged 5 Jun (M. Fischer, R. Rowan); 1 at downtown Lakeland (*Polk*) 12 Jul (T. Palmer); 1 nest at

Boyd Hill Nature Park, St. Petersburg fledged three young by 6 Jul, the second year breeding has occurred there (D. Goodwin); two feeders in NE St. Petersburg were frequented this summer (A. and R. Smith, J. and L. Hopkins).

SHORT-TAILED HAWK: 1 light morph near Starkey Wilderness Park (*Pasco*) 6 Jun (K. Tracey); 1 dark morph at Weekiwachee Preserve (*Hernando*) 12 Jun (C. Black, B. Hansen); 1 immature dark morph at Kendall (*Miami-Dade*) 15 Jun (L. Manfredi); 1 dark morph caught an icterid at Lake Region Village 21 Jun (B. Cooper, D. Winter); 1 dark morph at Chassahowitzka WMA 22 Jun (T. Rogers, J. Kleen); 1 light morph adult over St. Johns MCA 30 Jun (K. Snyder, J. Bryan).

CRESTED CARACARA: 1 at the Zellwood sod farm 27 Jul (H. Robinson).

AMERICAN KESTREL: 1 at Homestead (*Miami-Dade*) 5 Jun (J. Boyd).

PEREGRINE FALCON: 1 in SW *Hamilton* 13 Jul (K. NeSmith, D. Hipes).

NORTHERN BOBWHITE: 30 at Zellwood 6 Jul (H. Robinson).

KING RAIL: 3 calling at Blackwater River Delta (*Santa Rosa*) 27 Jun (L. Duncan, P. Tetlow).

SORA: 1 at Fort Walton Beach STF 9 Jun (H. King); 1 heard (only) at Brasher Park, Port Richey (*Pasco*) 26 Jun (K. Tracey).

PURPLE GALLINULE: 22 at Zellwood 14 Jun and 25 Jun (H. Robinson).

COMMON MOORHEN: 92 young in 30 broods at PPM 7 Jul (P. Fellers).

AMERICAN COOT: 21 at Lake Jackson 11 Jun, with 1 remaining to 12 Jul (both G. Menk); 1 E of Corkscrew (*Hendry*) 21 Jun (J. Bouton, C. Ewell); 2 at Myakka River SP 30 Jul (J. Bouton, C. Ewell); up to 133 summered at Zellwood and 5 pairs attempted to nest, but no young were observed (all H. Robinson).

LIMPKIN: 1 pair with 3 chicks at Lake Alice, Gainesville 25 Apr (M. Manetz); 1 pair with 3 chicks at Bivens Arm (*Alachua*) 27 Apr (M. Landsman).

SANDHILL CRANE: 42 roosted at Eagle Ridge Mall (*Polk*) through the season (B. and L. Cooper).

WHOOPING CRANE: 5 SW of Bushnell (*Sumter*) 7 Jun (C. Black); 5 in N *Polk* 2 Jul (N. Combee, T. Palmer); 3 over Zellwood 6 Jul (H. Robinson).

BLACK-BELLIED PLOVER: up to 8 at Zellwood to 25 Jun, 2 there 6-9 Jul, and 1 there 27 Jul (all H. Robinson); 12 in winter plumage at Bill Baggs/Cape Florida SRA (*Miami-Dade*) 3 Jul (J. Boyd); 41 at W Kendall 21 Jul (J. Boyd).

SNOWY PLOVER: 7 adults and 3 juveniles at Fort Myers Beach (*Lee*) 24 Jun (C. Ewell).

WILSON'S PLOVER: 29 (including 5 nesting pairs) at Huguenot Park 19 Jun (R. Clark); 23 (including 5 chicks) at Fort Myers Beach 24 Jun (C. Ewell).

SEMIPALMATED PLOVER: 12 at Cape Florida SRA 3 Jul (J. Boyd); 4 at PPM 7 Jul (P. Fellers); 1 at Zellwood 23 Jul (H. Robinson).

PIPING PLOVER: 1 at Honeymoon Island SRA 14 Jul (L. Kinney); 3 at Shell Key (*Pinellas*) 18 Jul (P. Blair, K. Nelson).

AMERICAN OYSTERCATCHER: 1 at Navarre (*Santa Rosa*) 15 Jun (R. Rose).

BLACK-NECKED STILT: 31 (including 4 nesting pairs) at Talbot Island SP 25 Jun, and 56 birds there 31 Jul (both R. Clark); 1 pair at Kanapaha Prairie fledged 2 chicks by 9 Jul (S. Schwikert); up to 5 adults at PPSP produced 7 young in two broods by 10 Jul (R. Rowan, J. Hintermister, M. Manetz).

AMERICAN AVOCET: 1 at Talbot Island SP 1 Jul (R. Clark); 151 in breeding plumage at PPM 5 Jul (P. Timmer, C. Geanangel, L. Albright).

GREATER YELLOWLEGS: up to 3 at Zellwood to 12 Jun, singles there 29 Jun and 6 Jul, and 2 there 14 Jul-EOS (all H. Robinson); 1 at Shell Key 16 Jun (P. Blair, B. Ackerman); 3 at PPM 17 Jun (P. Fellers, L. Albright); 27 at Talbot Island SP 25 Jun (R. Clark); 4 at Carillon, St. Petersburg 3 Jul (K. Nelson, J. Fisher); 3 at SRSTF 3 Jul (G. Menk, K. MacVicar).

LESSER YELLOWLEGS: 4 at Zellwood 25 Jun and 61 there 14 Jul (both H. Robinson); 2 at Carillon 3 Jul (K. Nelson, J. Fisher); 1 in winter plumage at Cape Florida SRA 3 Jul

(J. Boyd); 3 at PPM 7 Jul (P. Fellers); 4 at SRSTF 10 Jul (G. Menk, S. Borderieux); 1 at PPSP 10 Jul (R. Rowan).

Willet: 2 at Lake Jackson 19 Jul (P. Conover); 8 in a flock at Zellwood 27 Jul (H. Robinson).

Spotted Sandpiper: 1 at Homestead (*Miami-Dade*) 5 Jun (J. Boyd); 1 at Tierra Verde (*Pinellas*) 11 Jul (M. Wilkinson); singles at Zellwood 16 Jul and 23 Jul (H. Robinson); 1 at Lake Region Village 21 Jul (B. and L. Cooper).

Upland Sandpiper: 1 at the Zellwood sod farm 9 Jul, and up to 5 there 20 Jul-EOS (both H. Robinson); 4 at Eglin Air Force Base (*Okaloosa*) 31 Jul (P. Bowen, L. Fenimore).

Whimbrel: 1 at St. Marks NWR 13 Jun (M. Collins); 4 at Huguenot Park 4 Jul (R. Clark); 3 at Shell Key 18 Jul (P. Blair, K. Nelson).

Long-billed Curlew: 1 at the Zellwood sod farm 25 Jun (H. Robinson); 1 at Shell Key 18 Jul (P. Blair, K. Nelson); 1 at Talbot Island SP 27 Jul (P. Leary).

Marbled Godwit: 2 at St. Marks NWR 21 Jun (H. Van Tal); 2 at Fort Myers Beach 24 Jun, and 10 there 2 Jul (C. Ewell); 30 at Shell Key 4 Jul (P. Blair).

Ruddy Turnstone: 9 molting into winter plumage at Cape Florida SRA 3 Jul (J. Boyd).

Red Knot: 80 (1 in breeding plumage) summered at Fort Myers Beach (C. Ewell), with 150 there 30 Jul (B. Postmus).

Semipalmated Sandpiper: 11 at Zellwood 5 Jun, and 8 there 7 Jun (both H. Robinson); 5 at Shell Key 4 Jul (P. Blair); 4 at SRSTF 10 Jul (G. Menk, S. Borderieux).

Western Sandpiper: 8 at PPM 12 Jul (P. Fellers, B. and L. Cooper); 3 at Zellwood 14 Jul (H. Robinson); 5 in winter plumage summered at Fort Myers Beach (C. Ewell).

Least Sandpiper: 5 at Zellwood 5 Jun, singles there 8 Jun and 4 Jul, and 31 there 14 Jul (all H. Robinson); 1 in winter plumage at Cape Florida SRA 3 Jul (J. Boyd); 29 at PPM 7 Jul (P. Fellers); 2 at PPSP 10 Jul (R. Rowan); 1 at SRSTF 10 Jul (G. Menk, S. Borderieux).

White-rumped Sandpiper: 2 at Zellwood 5 Jun, and 1 there 12 Jun (H. Robinson).

Pectoral Sandpiper: up to 12 at Zellwood 12 Jul-EOS (H. Robinson); 13 at PPSP 21 Jul (J. Hintermister, M. Manetz).

Dunlin: singles at Shell Key 4 Jul and 18 Jul (P. Blair, K. Nelson).

Stilt Sandpiper: 2 at Zellwood 14 Jul (H. Robinson); 1 at St. Marks NWR 16 Jul (J. Dozier).

Short-billed Dowitcher: 1 at Lake Jackson 9 Jul (G. Menk); 400+ at Talbot Island SP 11 Jul (R. Clark); up to 5 at Zellwood 14-20 Jul (H. Robinson); 145 at Bald Point (*Franklin*) 24 Jul (G. Sprandel).

Long-billed Dowitcher: 7 heard at Talbot Island SP 25 Jun, and ca. 50 heard there 11 Jul (both R. Clark); 1 adult heard at Zellwood 20 Jul (H. Robinson).

Wilson's Phalarope: 1 female in breeding plumage at Talbot Island SP 25 Jun (R. Clark).

Laughing Gull: up to 5 at Zellwood to 14 Jun (H. Robinson); 4800 (including "hundreds" of fledglings) at Huguenot Park through the season (R. Clark).

Ring-billed Gull: 1 at Lake Jackson 2 Jul (G. Menk, K. MacVicar); of 2 immatures that summered at Zellwood, 1 was killed and eaten by a Bald Eagle (!) 3 Aug, and the other was seen last 6 Aug (all H. Robinson).

Great Black-backed Gull: 1 first-year bird at Fort Myers Beach 11 Jul (C. Ewell et al.); 1 second-year bird at Shell Key 18 Jul (P. Blair, K. Nelson).

Gull-billed Tern: 28 (including some nesting) at Bird Island (*Duval*) 27 Jul (P. Leary); 4 pairs nested at Huguenot Park this season (R. Clark).

Caspian Tern: 11 at Zellwood 7 Jun, and 2 there 4 Jul (H. Robinson).

Forster's Tern: singles at Zellwood 5 Jun and 14 Jul (H. Robinson); 1 in breeding plumage at Sebastian Inlet (*Indian River*) 11 Jun (B. Wagner); 1 at Newnans Lake 13 Jul (R. Rowan).

Least Tern: 1 adult feeding a fledgling at Lake Jackson 14 Jun, and 60 birds there 2 Jul (G. Menk); no nests at Huguenot Park, only 1 unsuccessful nest at Guana River SP

(*St. Johns*), and no successful nests at Anastasia Island SRA (*St. Johns*) this season (all *fide* P. Powell); 180 birds at PPM 5 Jul (C. Geanangel, P. Timmer, L. Albright); 100 active nests at Fort Myers Beach 9 Jul (C. Ewell); 13 birds (including 3 juveniles) at SRSTF 10 Jul (G. Menk).

BRIDLED TERN: "many" off Jupiter 7 Jun (S. Nesbitt).

SOOTY TERN: 1 found dead W of Sunrise (*Broward*) 11 Jul (B. Wagner); 1 immature at Huguenot Park 12 Jul, a day with strong E winds (R. Clark).

BLACK TERN: 23 at PPM 17 Jun (P. Fellers, L. Albright); 2 at Huguenot Park 18 Jun (R. Clark); 4 at Zellwood 22 Jun and 3 there 12 Jul (both H. Robinson); 2 at Tierra Verde 11 Jul (M. Wilkinson); 100+ at Talbot Island SP 27 Jul (P. Leary).

BLACK SKIMMER: 2 at Zellwood 22 Jun (H. Robinson); 492 at PPM 12 Jul (P. Fellers, B. and L. Cooper); 300+ (including some nesting) at Bird Island 27 Jul (P. Leary).

WHITE-WINGED DOVE: 3 at Green Cove Springs (*Clay*) 30 Jun (C. Greene); 4 at McKay Bay (*Hillsborough*) 10 Jul (A. and R. Smith).

MOURNING DOVE: 1760 at Zellwood 5 Jun (H. Robinson).

COMMON GROUND-DOVE: 55 at Zellwood 12 Jun (H. Robinson).

KEY WEST QUAIL-DOVE: 1 at Cape Florida SRA to at least 4 Jun (*fide* D. and H. Hull).

GOFFIN'S COCKATOO: 1 with a band on its left leg at Heritage Park, Plantation (*Broward*) 16-20 Jun (S. Epps) had been there for some time, according to park employees.

BUDGERIGAR: 1 at Zellwood 23 Jul-6 Aug (H. Robinson).

PARROTS: at a Fort Lauderdale (*Broward*) roost that has been active for >20 years, there were over 100 birds 24 Jul. Most were Red-crowned or Orange-winged parrots, with single Yellow-naped, Yellow-headed, and Mealy parrots present (J. Davey, B. Pranty et al., photos to FOC).

BARN OWL: 1 pair that nested in the main pump house at Zellwood produced 3 nestlings in Jun (H. Weatherman et al.).

BURROWING OWL: 3 adults and 6 juveniles at Albert Whitted Airport, St. Petersburg 14 Jun (L. Snyder, P. Bowen); 1 disperser (age unknown) at Avon Park Air Force Range (*Highlands*) 13 Jul (B. Pranty); 15 birds (including 6 juveniles) at Eglin Air Force Base (*Okaloosa*) 31 Jul (P. Bowen, L. Fenimore).

LESSER NIGHTHAWK: 1 at Gulf Breeze 1 Jun (L. and W. Duncan).

COMMON NIGHTHAWK: 26 at W Kendall 3 Jul (J. Boyd).

RUBY-THROATED HUMMINGBIRD: 2 in female plumage at Honeymoon Island SRA 12 Jul (L. Kinney).

BELTED KINGFISHER: 1 at Zellwood 24 Jun, and 3 there 27 Jul (both H. Robinson); 1 male at Key West (*Monroe*) 29 Jul (J. Ondrejko).

*WILLOW FLYCATCHER: 1 seen and heard (singing *fitz-bew*) at Zellwood 27 Jul (H. Robinson).

*TROPICAL/COUCH'S KINGBIRD: 1 silent bird at Gulf Breeze 14 Jun was thought to be a Tropical Kingbird based on bill size and bill shape (B. Duncan).

*TROPICAL KINGBIRD: 1 Fort DeSoto CP (*Pinellas*) 7 Jul-EOS (L. Atherton et al.).

EASTERN KINGBIRD: 1 at Weedon Island Preserve (*Pinellas*) 24 Jun (L. Hopkins, P. Blair) was called a "late migrant!" (R. Smith).

RED-EYED VIREO: 10 at Saddle Creek CP (*Polk*) 16 Jul (P. Fellers).

BLACK-WHISKERED VIREO: 1 *barbatulus* at Gulf Breeze 1-2 Jun (B. and L. Duncan); 1 male singing at Cayo Costa SP (*Lee*) 6 Jun (C. Ewell, A. Salcedo); 1 singing at Honeymoon Island SRA 11 Jul (R. Smith).

PURPLE MARTIN: at least 2000 at St. Petersburg 12 Jun (J. Buhrman); 9000 at a roost at the Rocky Bayou bridge (*Okaloosa*) 19 Jun (D. Ware); 1935 at Zellwood 19 Jun, and 1795 there 4 Jul (both H. Robinson); 1 or more migrants at Florida International University (*Miami-Dade*) 24 Jun (J. Boyd); 20,000 estimated at the I-10 roost over Escambia Bay (*Escambia*) 12 Jul (D. Timmons).

TREE SWALLOW: 2 at Zellwood to 12 Jul (H. Robinson).

Northern Rough-winged Swallow: 2 flying N at Cayo Costa SP 6 Jun (C. Ewell, A. Salcedo); 215 at PPM 5 Jul (C. Geanangel, P. Timmer, L. Albright); 1 at Lake Jackson 16 Jul (G. Menk, L. Thompson); 1 or more migrants at W Kendall 29 Jul (J. Boyd).

Bank Swallow: 2 at Fort DeSoto CP 20 Jul (P. Blair, L. Hopkins); 1 at Zellwood 20 Jul (H. Robinson); 250 at W Kendall 31 Jul (J. Boyd).

Cliff Swallow: 300 at W Kendall 31 Jul (J. Boyd).

Barn Swallow: 5 fledged from 2 nests at Micanopy 1 Jun and 9 Jun (L. Price); 1 flying N at Cayo Costa SP 6 Jun (C. Ewell, A. Salcedo); 1 pair building a nest under a water control structure at Fort Drum MCA 22 Jun (S. Rowe); ca. 30 birds (mostly juveniles) along Fellsmere Grade (*Brevard* and *Indian River*) 19 Jul probably bred nearby (S. Rowe); 2 heading S at Avon Park Air Force Range (*Highlands*) 23 Jul (B. Pranty); 1000 at W Kendall 31 Jul (J. Boyd); up to 100, including many nests, at Zellwood through the season (H. Robinson et al.).

American Robin: 1 at Gainesville 10 Jun (Z. Neece); birds again bred in N Pensacola this summer (D. Timmons).

Brown Thrasher: 1 at W Kendall 18 Jul (J. Boyd).

Yellow Warbler: 1 at Fort DeSoto CP 23 Jul (L. Atherton et al.); 1 at Newnans Lake 23 Jul (R. Rowan, D. Reed); 1 at St. Marks NWR 29-31 Jul (T. Kennedy, H. Horne).

Prairie Warbler: 1 at Newnans Lake 23 Jul (R. Rowan, D. Reed); singles at Zellwood 23 Jul and 27 Jul (both H. Robinson).

Black-and-white Warbler: 1 at Saddle Creek CP 16 Jul (P. Fellers); 1 female at Bonner Park (*Pinellas*) 17 Jul (J. Fisher).

American Redstart: 1 at Newnans Lake 23 Jul (D. Reed, R. Rowan).

Louisiana Waterthrush: 1 at Tallahassee (*Leon*) 24 Jun (F. Rutkovsky); 1 at Bald Point 7 Jul (J. Dozier); 1 at Lake Alto (*Alachua*) 8 Jul (J. Winn); 1 at Dunedin Hammock (*Pinellas*) 10 Jul (R. Smith); 1 at Fort George Island SP (*Duval*) 15 Jul (R. Clark).

Yellow-breasted Chat: 1 singing at Crystal River State Buffer Preserve to 10 Jun (A. and B. Hansen).

Seaside Sparrow: 1 *fischeri* in coastal woods at Gulf Breeze 7 Jul (B. Duncan).

Northern Cardinal: 86 at Zellwood 12 Jun (H. Robinson); 32 at Saddle Creek CP 16 Jul (P. Fellers).

Blue Grosbeak: 32 at Zellwood 12 Jun (H. Robinson).

Indigo Bunting: up to 7 summered at Zellwood (H. Robinson).

Painted Bunting: up to 8 males (2 adults and 6 first-year birds) summered at Zellwood (H. Robinson).

Dickcissel: 13 males and at least 5 females summered at Zellwood, with 2 nests found and a female observed feeding 2 fledglings (H. Robinson, B. Pranty and G. Basili et al., MS in prep.). This was the first nesting record and first breeding report in Florida.

Shiny Cowbird: 1 male at St. Petersburg 24 Jun-EOS (J. and L. Hopkins); 1 male at Gulf Breeze 8 Jul was the seventeenth area report (B. Duncan); 1 male at Zellwood 12 Jul (H. Robinson).

Brown-headed Cowbird: 1005 at Zellwood 16 Jul (H. Robinson).

Orchard Oriole: 1 first-year male singing at Zellwood through the season (H. Robinson et al.), and 3 birds there 6 Jul, which probably indicates breeding (H. Robinson).

House Finch: 7 at Hugh Taylor Birch SRA (*Broward*) 27 Jul (W. George); birds bred successfully in NE Fort Lauderdale (*Broward*) in 1997 and 1998 (*fide* W. George) birds are "apparently well established" on the S side of the St. Johns River (*Duval*), with family groups seen visiting feeders this summer (*fide* P. Powell).

American Goldfinch: 1 female at Tallahassee 21 Jun (D. Morrow).

House Sparrow: up to 2 summered at Zellwood (H. Robinson).

Pin-tailed Whydah: 1 male at Deltona (*Volusia*) in Jun (M. Tilghman, photo to FOC).

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SCANNING BEHAVIOR BY WINTERING NORTHERN MOCKINGBIRDS

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Abstract.—Northern Mockingbirds *(Mimus polyglottos)* wintering in Florida scrub regularly scan from exposed perches shortly after sunrise and before sunset. I obtained weekly samples from ten mockingbird territories during fall and winter to determine whether mockingbird scanning was related to (1) raptor abundance or (2) conspecific activity. In addition, I took vegetation measurements to determine if scanning was related to tree density. Mockingbirds changed perches more frequently early in the season when hawk abundance was high, but mean scan time and number of scanning bouts did not vary with weekly hawk abundance. Number of scanning bouts and calls by focal birds were positively correlated with calls by conspecific neighbors. The latter data, coupled with field observations, suggest that scanning is for detection of competitors, but further study is needed.

Vigilance behavior in animals has been widely studied, principally in relation to predation risk, which is an important area of modern behavioral ecology (Pulliam 1973). Scanning behavior, sometimes defined as observation of the environment for predators (Lima 1987), is a major component of vigilance. Studies have linked evidence from scanning behaviors to larger social contexts, such as evolution of sociality (Hoogland 1979, Lima and Dill 1990) and sentinels in family groups (McGowan and Woolfenden 1989, Hailman et al. 1994). However, scanning may serve purposes other than anti-predatory vigilance; for instance, territorial individuals could scan their environment to detect neighbors against whom they are competing for territories or food resources. I noted that Northern Mockingbirds *(Mimus polyglottos)* wintering in Florida scrub at Archbold Biological Station engaged in prolonged bouts of scanning from the tops of exposed perches on a daily basis. Previous studies have mentioned mockingbird scanning in pass-

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ing (Michener and Michener 1935, Merritt 1980), but to my knowledge none has directly addressed its purpose.

I monitored mockingbird scanning behavior in the fall and winter of 1996 to describe this behavior quantitatively and to evaluate hypotheses related to scanning behavior. The first hypothesis was (1) that scanning behavior is for detection of hawks while mockingbirds go about their daily routine. Accordingly, I predicted that scanning behavior would decrease with seasonal decline of hawks after fall hawk migration. McGowan and Woolfenden (1989) found such a decrease in sentinel scanning activities by Florida Scrub-Jays *(Aphelocoma coerulescens),* whose scanning behavior is superficially similar to that of mockingbirds, except that it occurs in the context of group foraging. The second hypothesis I examined was (2) that scanning behavior is a territorial response to other mockingbirds. If the latter occurs, I predicted that mockingbird scanning activities would be correlated with vocalizations by conspecifics. Finally (3), I tested the hypothesis that scanning is related to habitat visibility. This hypothesis, not exclusive of the previous two, predicts that animals with more visual obstructions in their territories will spend more time scanning (Metcalfe 1984), regardless of the function of scanning.

Methods

Scan samples

I sampled scanning behavior weekly in 10 focal Northern Mockingbird territories shortly after mockingbird winter territory establishment in Florida scrub habitat. I obtained samples for nine weeks from 21 October to 22 December 1996 at Archbold Biological Station, Lake Placid Florida. Although I was only able to color-band one focal bird, it is well known that mockingbirds establish and defend stable winter territories (Laskey 1935, 1936, Breitwisch et al. 1986, Logan 1987, Derrickson and Breitwisch 1992), including mockingbirds previously studied at Archbold Biological Station (Halkin 1983). The mockingbirds I observed used the same perches for 10 weeks (median perches/territory = 5, range 2-6); thus I am confident that I observed the same territories between weeks, although I cannot be absolutely certain that a given bird was not replaced by another conspecific. Distance between territories averaged 1108.8 ± 569.6 m (SD). Sample observations were made 20-30 m from the focal mockingbird from the top of an all-terrain vehicle and offered a largely unobstructed view of the surroundings. My presence did not appear to affect the birds' behavior. I sampled each territory weekly for a period of 30 min from sunrise-0930 am or 1630-sunset. Although I looked for scanning mockingbirds throughout the day, I rarely observed mockingbirds in scanning postures at other times, and speculate that heat reduced their activity during midday hours. Birds also did not scan on extremely windy days, and morning samples were more reliably to obtain generally (median number of morning samples/territory = 6, range 3-7; median number of evening samples/territory = 2, range 1-3). I attempted to stratify sampling so that birds would have roughly similar numbers of morning and evening samples. Due to windy weather and occasional lack of evening scans, I was not able to sample all ten birds during all nine weeks (median territories sampled/week = 10, range 6-10).

I defined scanning as regular horizontal movement of the head in all directions relative to the body while on an exposed perch lasting at least 30 s, during which other activities, such as preening or flycatching, were not performed. To test the hypothesis that scanning serves an anti-predatory role, I estimated seasonal abundance of hawks in a manner similar to McGowan and Woolfenden (1989), who correlated hawk sightings with sentinel scanning behavior by Florida Scrub-Jays. I counted the number of hawks that I saw during observations and other fieldwork, excluding Red-tailed Hawks *(Buteo jamaicencis),* which rarely prey upon adult songbirds. I recorded hawk abundance as number of hawks/hour for each week of the study. To test the hypothesis that scanning is for detection of conspecifics, I counted frequency of conspecific chats and chatbursts, territorial vocalizations made by wintering mockingbirds (Logan et al. 1983, Logan 1985). I also counted the frequency of these calls by focal birds ("focal calls") to see if they were correlated with calls by conspecifics ("conspecific calls"). Finally, to test the hypothesis that scanning is related to habitat visibility (Metcalfe 1984), I flagged all focal mockingbird perches and used point-quarter methods (Barbour et al. 1987) to calculate tree density (≥10 cm dbh) near perches for each territory. Distances to the nearest tree were measured with a meter tape for trees under 17 m distance from the perch and with a rangefinder (Ranging 400) for greater distances. I was not able to take tree density estimates for one territory located on private property.

SCANNING BEHAVIOR ANALYSES

Scanning variables that I analyzed were (1) mean scan time, (2) number of scanning bouts, defined as the number of occurrences during 30 min when the focal bird was on a scanning perch; i.e. a bird scanning at the start of an observation period that left to feed and later resumed its perch would be scored as having two scanning bouts for that observation. Number of perch changes (3) was the number of times the focal bird changed position exclusive of new scanning bouts. Scan time was taken as 60 30s instantaneous samples (Altmann 1974) and was arcsin-square-root transformed, which improves the normality of proportions (Sokol and Rolf 1981). Number of bouts and perch changes were expressed as the number of occurrences during the 30 min observation period measured at the time of the instantaneous sample.

I first tested for differences between morning and evening samples by comparing seasonal means of variables for each territory using paired t-tests. To determine if responses changed over weeks I ran Spearman rank correlations of the weekly means of the scan and call variables (across all territories) against week of the observation. If variables did not differ between morning and evening samples, I retained combined samples in the subsequent correlation analyses of weekly means. If morning and evening samples by territory were significantly or marginally ($P < 0.10$) different, I used only morning samples because of the larger sample size for morning observations. I performed the same analysis to determine if focal or conspecifc calls changed over the season. To test the hypothesis that scanning is for detection of hawks, I similarly ran Spearman rank correlations of the weekly means of the scan variables against weekly hawk abundance.

To test for the importance of scanning in detecting conspecifics I ran a separate repeated-measures covariance analysis for each of the three scanning variables identified previously. For each analysis, I used "conspecific calls" as the independent continuous covariate of interest. To account for repeated sampling over the nine weeks, territory and week were included as blocking factors, with territory × week specified as the subject (Littell et al. 1996). I first ran preliminary analyses to determine if conspecific calls varied over weeks. If it did not, I excluded this interaction from subsequent analyses. I also specified parameter estimates to determine the direction of any relationship between conspecific calls and the scanning variables. I performed an analysis similar to the above for "focal calls".

Finally, I tested for the effects of vegetative obstruction on scanning behavior using territorial means calculated over the entire nine weeks of the study. I ran Spearman rank correlations between seasonal means of the three scanning variables and tree density.

RESULTS

Number of scanning bouts for focal birds were more frequent in morning compared to evening samples (Table 1, Fig. 1). Differences in average number of perch changes indicated a trend for more frequent perch changes in the morning (Table 1, Fig. 2). Scan time by mockingbirds did not vary between morning and evening samples (Table 1, Fig. 3). Focal mockingbirds and conspecific neighbors both called more frequently during morning samples (Table 1). Morning focal calls did not change with season ($P > 0.20$) nor did morning conspecific calls ($P > 0.10$).

Hawk abundance declined significantly over the 9 weeks of sampling (Fig. 1; $r_s = -0.85$, $P = 0.004$). Hawk abundance was significantly correlated only with perch changes by focal mockingbirds (morning samples; $r_s = 0.72$, $P = 0.03$; Fig. 2). Focal mockingbirds reduced perch changes over the progression of the season (Fig. 2; morning samples; $r_s = -0.69$, $P = 0.04$) but did not alter any of the other behaviors seasonally (Figs. 1 and 3). Hawks that I sighted included Merlin *(Falco columbarius),* American Kestrel *(F. sparverius),* Sharp-shinned Hawk *(Accipiter striatus),* Cooper's Hawk *(A. cooperii),* and Northern Hanier *(Circus cyaneus).* Hawks flew into focal territories during three observations. Florida Scrub-Jays were present at all three and gave hawk alarms (Elowson and Hailman 1991). Both scanning mockingbirds and scrub-jays dived into cover immediately in response to hawks. On a third occasion, jays gave the alarm and dived, but the mockingbird had already been under shrubbery for several minutes before the hawk appeared.

The repeated-measures analysis indicated that conspecific calls was significantly positively correlated with number of bouts (parame-

Table 1. Means (±SE) by territory for variables measured during mockingbird scan samples by morning, evening and combined samples. Statistics represent *t*-values and probability levels from one-sample two-tailed *t*-tests comparing morning and evening samples ($n = 10$ territories).

Variable	morning	evening	combined	*t*	*P*
Scan time (proportion of 30 min)	0.60 ± 0 03	0.66 ± 0.07	0.62 ± 0.03	1.0	0 3
Number of bouts	3.60 ± 0.28	2.37 ± 0.30	3.25 ± 0.17	-2.4	0.04
Perch changes	2.69 ± 0.38	1.35 ± 0.42	2.32 ± 0.28	-2.0	0.07
Focal calls	1.84 ± 0.28	0.15 ± 0.11	1.36 ± 0.21	-5.1	0.0007
Conspecific calls	5.53 ± 0.44	1.02 ± 0.38	4.21 ± 0.40	-11.4	0.0001

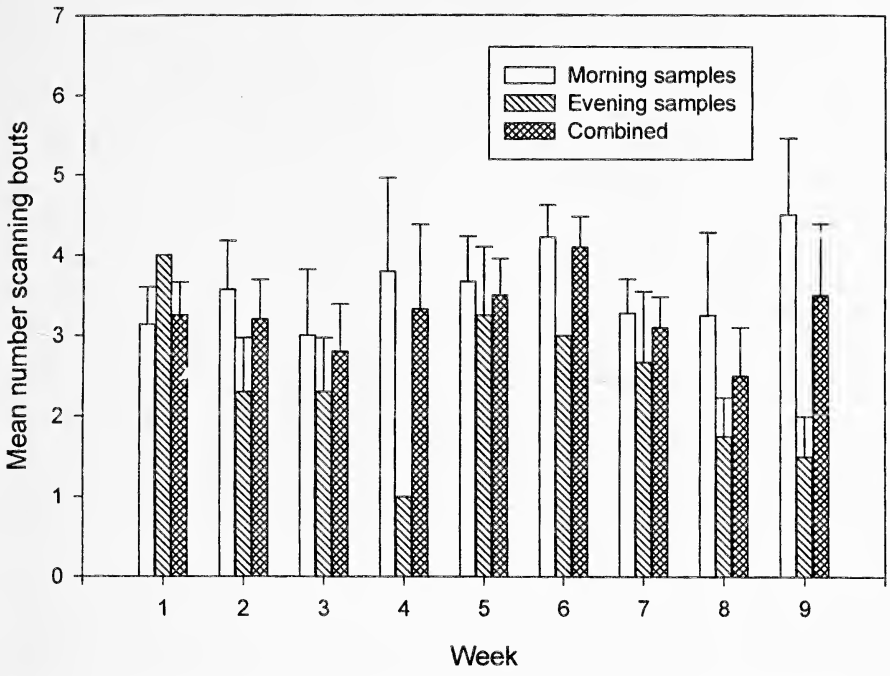

Figure 1. Number of scanning bouts (±SE) by week for focal mockingbirds by morning, evening, and combined samples.

ter estimate 0.19, $F = 12.0$, $P = 0.001$). Neither scan time or perch changes were significantly related to conspecific calls (scan time: parameter estimate - 0.02, $F = 2.2$, $P = 0.14$; perch changes: parameter estimate 0.13, $F = 2.3$, $P = 0.13$). Focal calls were significantly positively correlated with conspecific calls (parameter estimate 0.24, $F = 24.3$, $P = 0.0001$). Territory and week did not significantly explain variation for any of the scanning variables ($P \geq 0.13$, all tests) except for focal calls, where there was significant variation among territories ($F = 2.0$, $P = 0.05$). Conspecific calls × week interactions were not significant and were not included for any of the analyses.

Tree density was not significantly correlated with any of the scanning variables (mean tree density 8.35 ± 3.04 trees/ha; $P > 0.22$, all tests).

DISCUSSION

With the exception of perch changes, scanning behaviors did not change over the nine weeks of sampling. Although mean number of weekly perch changes was positively correlated with weekly hawk abundance (Fig. 2), neither mean scan time or number of scanning bouts was

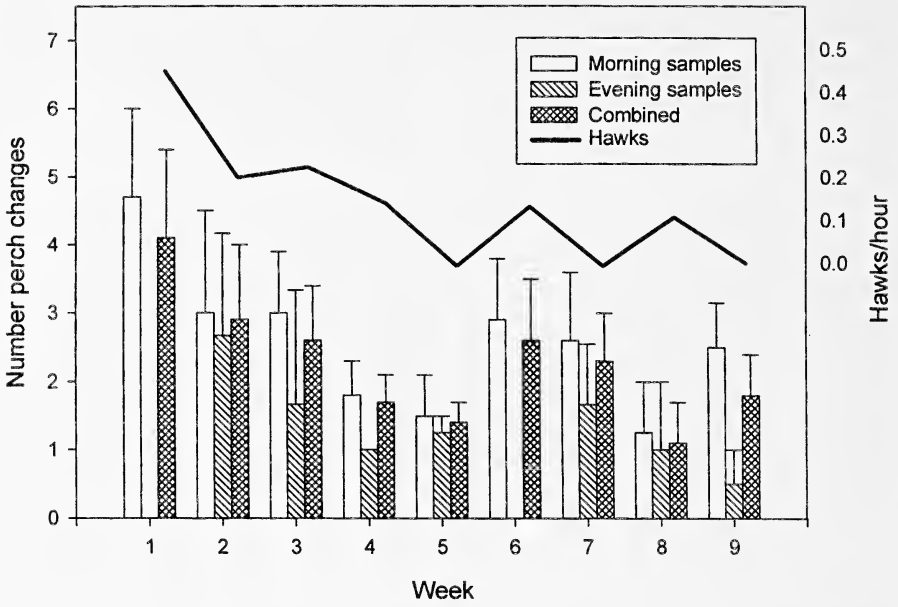

Figure 2. Hawk sightings/hour over the season and average perch changes (±SE) by week by morning, evening, and combined samples.

correlated with hawk abundance. Conspecific calls were positively correlated with both number of scanning bouts and calls by focal mockingbirds. Scanning behaviors were not correlated with tree density.

Although not the case in this study, Logan et al. (1983) and Breitwisch et al. (1986) noted that singing and calling by wintering mockingbirds declined seasonally. Breitwisch et al. (1986) viewed this as a switch from establishing to maintaining fall territories. My samples commenced shortly after fall territory establishment and overlapped temporally with Breitwisch's et al.'s samples; however, with the exception of perch changes, birds in my study did not alter behaviors seasonally. Other studies of wintering mockingbirds have observed influxes of wandering fall mockingbirds and ensuing territorial battles between floaters and territory holders (Michener and Michener 1935, Laskey 1936). If vigilance by mockingbirds serves an intra-specific purpose, these studies suggest that birds should remain vigilant throughout the nonbreeding season.

McGowan and Woolfenden (1989) documented a strong positive relationship between sentinel behavior by Florida Scrub-Jays and hawk sightings, with sentinel performance highest during periods of hawk abundance. Although scrub-jay scanning behavior appears similar to mockingbird scanning, Florida Scrub-Jays scan as sentinels in a coordinated system within the context of group living (McGowan and Wool-

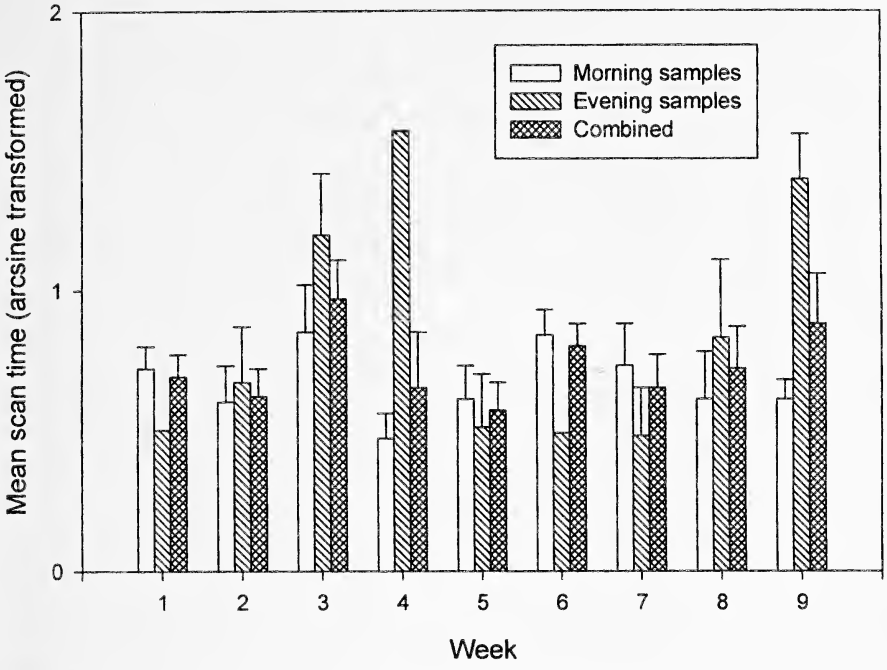

Figure 3. Mean scan time by focal mockingbirds (±SE) by week by morning, evening, and combined samples.

fenden 1989), whereas the mockingbirds I observed were always solitary. Scrub-jays also feed in open areas of sand (Woolfenden and Fitzpatrick 1996), whereas mockingbirds typically dropped directly below the scrub canopy between bouts, presumably to feed on berries or insects. Florida scrub is an open habitat affording good visibility, and my view of the shrubs and spaces between them was generally unobstructed; however, I witnessed mockingbirds feeding in the open on only a handful of brief occasions during many hours of observation. Between scanning bouts mockingbirds were typically under shrubs and out of sight until re-emerging to scan at the same or a different perch. Mockingbirds appear to be exposed to potential predation by raptors only during scanning or territorial chases. Large snakes and bobcats *(Lynx rufus)* are also present at the sites and are the only other likely predators on adult scrub-jays (McGowan and Woolfenden 1989). I saw no snakes or bobcats during my observations at mockingbird territories.

Chat and chatburst calls by conspecifics were positively correlated with both number of scanning bouts and number of calls by focal mockingbirds, but not with the other scanning variables. These findings suggest that focal birds responded to neighbor's calls by calling themselves

and by taking scanning positions more frequently, although they did not scan for longer periods when conspecifics called more frequently.

In addition to positive correlations between conspecific calls and focal bird behaviors (number of scanning bouts and focal calls), field observations suggest that mockingbird scanning is not anti-predatory in nature. Anti-predatory scanning by foraging birds occurs in brief instances, often measured in seconds, while birds actively forage (reviewed in Lima and Dill 1990). Conversely, the samples I obtained sometimes consisted of one single 30-minute scanning bout, with mockingbirds remaining perched as I left. Bouts of scanning by mockingbirds appeared to be longer than necessary compared to the vigilance needed for intermittent foraging. Scanning for conspecific or interspecific competitors could provide a strong impetus for territorial vigilance, especially given the importance of food in winter mockingbird territories (Moore 1978, Safina and Utter 1989). Although I did not measure activities of other species, Moore (1978) found that aggression by wintering mockingbirds toward other songbirds was directly proportional to the extent of frugivory among these competitors. I observed focal mockingbirds chasing a Yellow-rumped Warbler *(Dendroica coronata)* and Brown Thrasher (*Toxostoma rufum)* during one sample each, Rufous-sided Towhees *(Pipilo erythrophthalmus)* during two different samples, and Gray Catbirds *(Dumetella carolinensis)* during other field work. I witnessed several chases of conspecifics by focal birds during my samples.

Although further study is needed, qualitative and quantitative evidence are most consistent with the hypothesis that winter mockingbird scanning serves as a response to competitors. The influence of conspecific or interspecific competitors on scanning could be further ascertained by correlating densities of neighbors with scanning behaviors by focal birds. Removing competitors and monitoring the scanning and vocal responses by focal birds could then determine whether these activities increase or decrease in the absence of competitors.

Acknowledgments

I am indebted to Mark Ellersieck for his help with the statistical approach for this study. Brian Nelson, Keith Tarvin, Jack Hailman, and Curt Adkisson all helped me brainstorm on this project. Keith Tarvin, Chris Casado, Leslie Backus, and Roberta Pickert helped determine interterritorial distances with GIS. The statistical input of John Hewett, Matt McIntosh, and Trish Jones was also of help. Comments by anonymous reviewers greatly improved upon earlier versions of the manuscript. I thank Glen Woolfenden for his cooperation.

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NOTES

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THE CUBAN MARTIN IN FLORIDA

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The fifth and sixth editions of the American Ornithologists' Union [AOU] Check-list of North American Birds (1957, 1983) considered the Cuban Martin, *Progne cryptoleuca*, to be "casual" in southern Florida, mentioning records from Cape Florida, Key West, and Clearwater. The seventh edition (AOU 1998) omitted any mention of Florida in the distribution of *P. cryptoleuca*. The reason for this omission is unclear. Addition or removal of the United States to the distribution of a species is subject to a vote by the Committee on Classification and Nomenclature. There is no committee record that such a vote was taken relative to *Progne cryptoleuca*. It is likely that the line mentioning the casual occurrence of the species in Florida was accidentally dropped when the text of the sixth edition was revised for the seventh edition. Notice of that omission, brought to the committee's attention by Marshall Iliff via J. V. Remsen, has prompted this review of the status of the species in Florida and the United States.

Historical record.—Baird (*in* Baird, Cassin and Lawrence 1858:923) discussed a martin (*Progne* sp.) taken by Wurdemann at Cape Florida [Florida], 18 May 1858 (U.S. National Museum of Natural History [USNM] 10368). The specimen was different from any specimen of *Progne subis* (then called *purpurea*) available, and differed from *P. dominicensis* and *chalybea*, but Baird considered that it might be merely a peculiar plumage stage of *P. subis*. Baird (1865) "somewhat hesitatingly" referred that specimen to *P. cryptoleuca* when he named that species, giving its range as "Cuba, and Florida Keys (?)."

Ridgway (1877:459) included Cuba and southern Florida in the range of *P. cryptoleuca*, mentioning single immature males from Cape Florida and Clearwater, Florida. He later (Ridgway 1904) again cited these two Florida specimens, but gave no literature citation that referred to the Clearwater bird. That undated specimen, taken by Col. S. T. Walker, was entered into the USNM catalog (78046) in 1879; it was entered by generic name only but *subis* was added in pencil at some undetermined later time.

Scott (1889) believed that martins breeding on the Gulf coast of Florida as far north as Tarpon Springs were *P. cryptoleuca*. He sent four specimens from Tarpon Springs, one female and three males, to J. A. Allen at American Museum of Natural History who confirmed Scott's preliminary identifications of three *P. cryptoleuca* and one intermediate between that form and *P. subis*. Scott's (1892) listing of *Progne cryptoleuca* as a breeding migrant in the Caloosahatchie River region (as well as *P. subis*) apparently was based on this identification and has generally been overlooked or ignored.

Howell (1932) stated that martins breeding in southern Florida "all proved to be typical *subis*, and not *cryptoleuca* as it had been surmised they might be (cf. Scott, 1889a, p. 325)." There is no indication as to what "proof" Howell had, but Ridgway (1904:35) had previously treated the birds reported by Scott as *P. s. subis*. Howell (1932) listed only the Cape Florida and Clearwater birds from Florida as *cryptoleuca*.

Hellmayr (1935) added a specimen (Field Museum of Natural History [FMNH] 43147) from Key West to the Florida records of *P. cryptoleuca*. There seems to be no previous mention of that specimen in the literature. The specimen, an immature male, was

taken by L. W. Brownell on 9 May 1895. The specimen was at one time in the collection of Ned Hollister, who was an employee of the Bureau of Biological Survey in the early 1900s. On one of the labels there is an undated note "new form to be described by Mearns—Brewster" but the bird seems not to have been considered with *P. s. floridana,* which Mearns (1902) named.

Phillips (1986:9) considered *P. cryptoleuca* (as a subspecies of *P. dominicensis*) "casual" in southern Florida, but mentioned only the Cape Florida bird. He considered the Clearwater record an erroneous report; he wrote "worn *s. subis*" on the label of that USNM specimen. He did not mention the Key West specimen.

Robertson and Woolfenden (1992) continued to assign the individual birds from Cape Florida, Key West, and Clearwater to *P. cryptoleuca.* On the basis of a personal communication, they treated the Tarpon Springs birds as would Stevenson and Anderson (1994), treating three as *subis* and questioning the fourth. Stevenson and Anderson (1994), however, listed all these records in a paragraph following headings for *P. cryptoleuca, chalybea,* and *dominicensis,* and it is not clear, except for the historical record, to which taxon they are referred. Stevenson had examined the four Tarpon Springs specimens reported by Scott (1889) in the Natural History Museum (British Museum of Natural History 92.3.20.176-179) and "referred 3 (possibly all 4) to *subis*; specimen 177, a male, may be *cryptoleuca.*"

Both Robertson and Wolfenden (1992) and Stevenson and Anderson (1994) pointed out that a sight report (Edscorn 1977) of a Cuban Martin (no scientific name) was in error.

Reevaluation.—The two specimens in USNM were, even for their time, very poorly made specimens. Both were under-stuffed, and one was (by 1999) badly stained with grease ventrally. It was difficult to compare them to fresher, better prepared specimens. Claudia Angle relaxed, degreased, washed, and remade these specimens to make an adequate comparison possible. Both specimens show the central dark shaft streaks on most of the ventral feathers, typical of first-year male *P. subis,* rather than the unstreaked white ventral feathers of young male *P. cryptoleuca.* Undertail coverts have large dark central patches rather than being nearly pure white. In my opinion, both of these specimens, from Cape Florida and Clearwater, represent *P. subis,* not *P. cryptoleuca.*

Pamela C. Rasmussen examined W. E. D. Scott's Tarpon Springs specimens in the Natural History Museum at my request. Three adult males (92.3.20.177-179) taken on 17 Apr. 1889 originally thought to be *P. cryptoleuca* were identified as *P. subis*; this series includes the specimen about which Stevenson was uncertain. An adult female taken on that same date, but not mentioned by Scott (1889) or Stevenson and Anderson (1994) was originally identified as *P. subis.* A juvenile female taken by Dickinson for Scott on 15 July 1887 (92.3.20.176) also was originally labeled as *P. cryptoleuca.* No material of *P. cryptoleuca* of the same age was available for comparison at the Natural History Museum, but the heavy shaft streaks on the whitish feathers of the underparts suggest *P. subis.*

At the request of J. V. Remsen, T. S. Schulenberg reexamined specimen 43147 at the Field Museum of Natural History and verified that it is *P. cryptoleuca.* On 8 September 1999, I had the opportunity (with Schulenberg) to compare the remade USNM specimens and the FMNH specimen with the series of *P. cryptoleuca* at the Field Museum. We agreed that only FMNH 43147 represents *P. cryptoleuca.* That specimen, then, is the only valid record of the occurrence of the Cuban Martin, *Progne cryptoleuca,* in Florida and the United States, where its occurrence should be considered accidental.

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FIRST RECORD OF THE NORTHERN LAPWING IN FLORIDA

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On 7 December 1997 at 1230, Eleanor and Frederick Pratt of Vermont discovered a Northern Lapwing (*Vanellus vanellus*) in Highlands County, Florida (Fig. 1). Within half an hour of discovery, the Pratts telephoned BP, who reported the sighting to others. The lapwing was intermittently present at this locality from 7 December 1997 to 4 January 1998, and a number of birders reported their observations. Attempts by us and others to find the bird during winter 1998-1999 were unsuccessful.

Figure 1. Northern Lapwing along Mossy Cove Road, Highlands County, Florida. First verifiable Florida record. Photograph by Larry Manfredi, 12 December 1997 (TTRS P710).

The lapwing was sighted along Mossy Cove Road, which extends 0.8 km from a fish camp on the eastern shore of Lake Istokpoga, east to County Road 621. Most of the habitat in the area is fenced "improved" cattle pasture. The bird was observed as close as 20 m (E. and F. Pratt *in litt.*) in a small portion of pasture on the north side of the road. The bird often flew in and out of the pasture, usually in a northerly direction. Searches by us and others elsewhere for the lapwing were limited because of lack of access to many areas, and were unsuccessful.

On the day of discovery and intermittently during the next few weeks, the edge of the pasture closest to the road was flooded. The dominant vegetation was bahiagrass (*Paspalum notatum*) with a small pickerelweed (*Pontedaria cordata*) marsh. The shoreline vegetation was trampled by cattle coming to drink. The trampled areas were interspersed with tussocks. Frequent visitors to the site were Little Blue Heron (*Egretta caerulea*), White Ibis (*Eudocimus albus*), Glossy Ibis (*Plegadis falcinellus*), Greater Yellowlegs (*Tringa melanoleuca*), Lesser Yellowlegs (*T. flavipes*), and Boat-tailed Grackle (*Quiscalus major*). Numbers of individuals of these species increased when water levels rose (BP and GEW pers. obs.).

Photographs of the lapwing were taken by several people, the best being the print shown in Figure 1. Identification is apparent from this photograph. The rather upright stance and large eye indicates the bird is a plover. The long, dark upturned crest of a few feathers indicates a lapwing of the genus *Vanellus*, and the head pattern with a pale face and dark bars at, below, and behind the eye, identifies the bird as a Northern Lapwing.

The original print by Larry Manfredi (TTRS P710) and a slide by Linda Cooper show the following colors. The elongated crest, large eyes, facial barring, wide breast band, outer wing, and most of the tail are blackish. The supercilium, feathering at the base of the bill, throat, sides, and outer tip of the tail are whitish. The nape and feathering behind the eyes are buffy. The back and scapulars are dark dull greenish, with buff edges to the scapulars. The small portion of the undertail coverts visible appear to be dull orange. The legs are hidden in the photographs, but field notes of GEW and the Pratts indicate that the legs were dull reddish-orange.

In flight the underwing linings and upper base of the tail were white, the wings were rounded, and the primaries were long relative to the secondaries. The legs did not extend beyond the tail (BP and GEW pers. obs.). The proportions of the wings, lack of buff edges to the back feathers (Hayman et al. 1986), and white tips to several of the primaries (W. Hoffman pers. comm.), indicated the lapwing was an adult in winter plumage.

When in flight, the wing beats sometimes were deep and jerky, and reminded us of the flight of a Common Nighthawk (*Chordeiles minor*). Mostly we observed the lapwing as it stood in dry ground in an upright posture. When foraging, it ran and plucked apparent arthropod prey from grass blades. We also noted foot shuffling and head scratching under the wing. The latter behavior characterizes plovers but not sandpipers (Van Tyne and Berger 1976). The loud strident call, given in flight, was *eee-eep*, and was soon mimicked by a European Starling (*Sturnus vulgaris*) (GEW pers. obs.).

The Northern Lapwing breeds in open country across Eurasia south of the tundra. Eastern populations winter well south of the breeding range. Most of the western populations are migratory, moving to southern Europe and northern Africa for the winter (Cramp and Simmons 1983, Hayman et al. 1986). The usual winter range of the species is similar in latitude to Florida.

Bagg (1967) listed all occurrences of the Northern Lapwing in North America through 1966. These reports were scattered along the Atlantic coastline from Baffin Island to Barbados, but were concentrated in Newfoundland and along the Gulf of St. Lawrence. Only nine reports were from the United States, all of them along the Atlantic coast (Maine, Rhode Island, New York, New Jersey, Delaware, North Carolina, and

Table 1. Reports of Northern Lapwings in North America since the publication of Bagg (1967). AB = American Birds, AFN = Audubon Field Notes, FN = Field Notes, NAB = North American Birds.

Date(s)	Location	#/Age	Reference
10 Oct 1968	Maine: Penobscot Co., Brewer	1	AFN 23:18
3 Jan 1971	Newfoundland: St. Johns, Quidi Vidi Lake	1	AFN 25:551
3-26 Dec 1983	Newfoundland: St. Johns	1	AB 38:294
8 Apr 1988 ff	Nova Scotia: Yarmouth	1	AB 42:408
10-13 Nov 1988	Newfoundland: Ferryland	1	AB 43:56
early Dec 1988	Newfoundland: Port Saunders	1	AB 43:279
22 Mar 1991	New York: Albany Co., New Scotland	1	AB: 45:422
5 May-20 Jul 1991	New Brunswick and Nova Scotia: Auluc	1	AB 45:409
23 Nov 1994	Newfoundland: Daniel's Harbor	1	FN 49:14
29-30 Dec 1994	Ohio: Adams	1	FN 49:153
28 Jan-25 Mar 1995	New York: Suffolk Co., Mecox Bay	1	FN 49:133, 232
6-7 Jul 1996	Delaware: Bombay Hook NWR	1	FN 50:933
26-30 Dec 1996	Massachusetts: Martha's Vineyard, Chilmook	1 ad	FN 51:729
1-4 Jan 1997	New Jersey: Cape May Co., near Goshen	1	Records of New Jersey Birds 24: 61
10 Mar 1997	Ohio: Ashtabula Co., near Andover	1	C. Schooley in litt.
7 Nov 1997	Newfoundland: Portugal Cove	1	FN 52:23
7 Dec 1997-4 Jan 1998	Florida: Highlands Co., Lake Istokpoga	1 ad	this paper
27 Dec 1997	Newfoundland: St. Anthony	1	FN 50:141
17-19 Nov 1999	Newfoundland: Cape Spear	1	NAB *fide* M. Patten

South Carolina). Seasonally the reports were concentrated in November, December, and January. Bagg (1967) found correlation between meteorological events over Europe and the North Atlantic Ocean that appear to account for groups of lapwings showing up in North America. However, he concluded that isolated occurrences of lapwings could not be interpreted from weather data with confidence.

To update Bagg's (1967) list of occurrences, we searched the winter, spring, and fall seasonal reports for the Atlantic coast regions published in *Audubon Field Notes* and its successors from 1967 to 1999. We also searched internet lists such as the BIRDCHAT archives (http://listserv.arizona.edu/lsv/www/birdchat.html). We found 19 reports of Northern Lapwings, all of single birds, of which nine were in the United States. Florida, Massachusetts, and Ohio were added to the list of states reporting the species (Table 1).

The only prior reference to a [Northern] Lapwing in Florida, at West Palm Beach Airport, Palm Beach County, on 9 June 1968 (Swem 1969), is unidentifiable from the published account. The description given seems more like that of a Southern Lapwing (*V. chilensis*), with, "considerable black on the face." Several Southern Lapwings occurred in southern Florida from 1959 to 1962, and some of these were known to be escapees (Robertson and Woolfenden 1992). The Northern Lapwing was excluded from the list of verified birds of Florida by Robertson and Woolfenden (1992) for lack of tangible evidence, and by Stevenson and Anderson (1994) because the report was completely undocumented. This report provides the first tangible evidence and description of the Northern Lapwing in Florida. The Florida Ornithological Society Records Committee accepted the record (R. Bowman pers. comm.; FOSRC 99-401).

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LATE BREEDING AND EARLY WINTER RECORDS OF EASTERN KINGBIRD IN LEON COUNTY, FLORIDA

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The Eastern Kingbird (*Tyrannus tyrannus*) is a common nesting bird in Florida with a breeding season that occasionally extends into early September. Breeding activities for the species, which is an early fall migrant, have previously been noted only as late as 15 September in the state (Stevenson and Anderson 1994). The bulk of migrants usually depart Florida by the middle of September (Stevenson and Anderson 1994). The Eastern Kingbird has been fully documented as a wintering bird only once: a single individual, discovered on the Lake Placid Christmas Bird Count (CBC) on 27 December 1994 and present until 6 January 1995, was photographed by Reed Bowman on 28 December 1994, and videotaped by Brooks Atherton on 1 January 1995 (Bowman et al. 1995). Other reported sightings in early winter in Florida and southeastern North America have lacked hard documentation and are assumed to have been misidentifications (Stevenson and Anderson 1994, LeGrand 1997). Any unseasonal Eastern Kingbird sightings in North America require thorough documentation.

In the fall and winter seasons of 1998-99, in Leon County, unusually late breeding and wintering dates were recorded for Eastern Kingbird. The winter sightings were confirmed by multiple observers, and documented with videotape. Unlike the previous winter record, the sightings reported here consisted of multiple individuals.

On 7 October 1998 while driving past a location where I had noticed a territorial pair of Eastern Kingbirds throughout the summer, I was surprised to see two kingbirds still present. As I watched, one of the kingbirds approached the other with an insect in its bill, whereupon the second bird began to beg. In response to the submissive posture and rapidly fluttering wings of the begging bird, the first bird fed it and departed. Within a few minutes, the behavior was repeated. The noticeably shorter tail and repeated begging behavior indicated that this bird was a dependent fledgling.

Two kingbirds were still present at this site through 17 October, and at least one was still present until 22 October. The site, at the intersection of Tharpe Street and Martin Luther King Boulevard, was an overgrown urban lot with a nearby row of pines and scattered live oaks. The birds may not have been detected on later visits as they ranged the area surrounding the intersection. The urban location of the sighting, and the scarcity of Eastern Kingbirds in general at such late dates, indicated to me that all of these October sightings were of the same birds.

By mid-September migrant Eastern Kingbirds have become scarce in the Tallahassee area; lingerers are usually represented by lone birds (G. Menk pers. comm.). I was therefore surprised to find at least six kingbirds at Sunset Landing on Lake Jackson on 30 September 1998. As their appearance coincided with the passage of Hurricane Georges, I theorized that these birds may have been migrants forced back to the north by the storm, in "reverse migration", as has been reported for other migrant landbirds encountering late season tropical storms (DeBenedictis 1986). My belief in this theory was reinforced by the presence of a flock of Purple Martins conservatively estimated at 73 individuals, a large assemblage for such a late date, on the same day also at Lake Jackson.

On 3 November 1998 while birding at Sunset Landing, I encountered and videotaped a group of ten Eastern Kingbirds at the same spot where I had encountered the kingbirds on 30 September. As I watched, these birds rose up high into the air and flew together towards the south along the western shoreline of the lake.

Over the next two months, a small flock of Eastern Kingbirds was consistently present along the western edge of Lake Jackson. Gail Menk reported six kingbirds on 3 December, numbers ranging from one to five between 5 December and 26 December, and three on the Tallahassee Christmas Bird Count on 1 January 1999. The latest sighting was of two birds by Menk on 3 January 1999. Others who observed the kingbirds during December and January include Scott Borderieux and Jim Cavanagh. The observers are all experienced birders extensively familiar with Eastern Kingbirds as well as similar species with which this species might be confused (i.e., Eastern Phoebe). No observers noted any vocalizations. The kingbird flock disappeared after early January, possibly because of an influx of cold weather.

These sightings constitute the second documented winter record, and the first record of multiple wintering Eastern Kingbirds in Florida. If the previous Florida record was indeed the only fully documented winter record for the United States, as has been speculated (Bowman et al. 1995), then the Leon County sightings represent an all-time winter maximum for the United States.

I thank Gail Menk for graciously allowing me to use information from his field notes.

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STATUS OF BREEDING LEAST TERNS IN THE INTERIOR OF CENTRAL FLORIDA FROM 1914-1962

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Least Terns (*Sterna antillarum*) have nested in the interior of Florida (away from tidewater) since 1887 (Lake Thonotasassa, Hillsborough County; Howell 1932); most breeding colonies have been located in central and south-central Florida (Lohrer and Lohrer 1973, Stevenson and Anderson 1994, Gore 1996). Nest-sites of Least Terns in the interior may be above ground (roof-tops of buildings) or on the ground (Gore 1996). Most nest-site substrates are also man-made (Lohrer and Lohrer 1973, Maehr 1982, Gore 1996). Outside Florida, Least Terns have nested in the interior of the United States east and south of the Mississippi and Ohio rivers only in South Carolina, on beaches at two man-made (hydroelectric) lakes in the 1960s (Chamberlain 1960, Smith 1961, Post 1967, Thompson et al. 1997).

With the recent validation of *Sterna antillarum antillarum* as a distinct subspecies (Johnson et al. 1998; see also Patten and Erickson 1996), the dry lakebed of Lake Jackson, Leon County, Florida, is the only natural site in the interior of the United States where this subspecies has nested (Lohrer and Lohrer 1973, Stevenson and Anderson 1994, McNair in press). The nesting substrates for the first breeding colonies in central Florida at Lake Thonotasassa (Hillsborough County: June 1887), Lake Harney (Seminole County: June 1915), and Orlando (Orange County: May 1930) (Howell 1932, Lohrer and Lohrer 1973) are unknown. I have examined copies of field notes and journals (henceforth called journals) of D. J. and W. H. Nicholson (FOS archives at the Florida Museum of Natural History), data slips for egg sets of the Nicholson brothers at several museums [American Museum of Natural History (AMNH), Delaware Museum of Natural History (DMNH), Western Foundation of Vertebrate Zoology (WFVZ)], and literature not covered by Lohrer and Lohrer (1973) or Stevenson and Anderson (1994). These sources provide additional documentation for Least Terns breeding at Lake Harney and in Orlando as well as new information on other breeding localities in the central peninsula (Orange and Seminole counties) plus Lake Okeechobee from 1914 to the early 1960s. This paper re-assesses the breeding status of Least Terns in the interior of the central peninsula during this period.

I present documentation for each breeding locality of Least Tern in the central peninsula of Florida in chronological order.

1) Lake Harney, Seminole County. Howell (1932) stated that Least Terns nested here in June 1915. D. J. Nicholson (1938; journals) discovered this breeding site and stated that 16 pairs (14 nests with clutches of two or three eggs) nested here in one colony on a small sandy flat in June 1914. D. J. Nicholson also stated that he was away from Florida in 1915. The water at Lake Harney is brackish (DeMort 1990).

2) Lake Conway, Orange County. Lake Conway, a freshwater lake, is 8 km south of Orlando. D. J. Nicholson (1938; egg slips) discovered a small colony (12-14 birds) breeding at Lake Conway in 1927. He collected a clutch of two eggs (DMNH 1702) on the sandy shore on 23 June, and on 30 June, a clutch of two eggs (DMNH 1705) on a small sandbar in the middle of the lake. These were the only active nests on the days he collected the eggs. Nicholson saw Least Terns at Lake Conway in 1936 but did not collect any egg sets. In 1939 D. J. Nicholson (journals) found one small colony (8 pairs) on the island and one set of two eggs on 4 June. In 1962, D. J. Nicholson collected three egg sets (DMNH 1809-1811; all clutches of two eggs each) from a small colony (5-6 pairs) from

28-30 June. On 30 June four nests were active (three clutches of two eggs each, one nest with a day-old downy young). On 13 July Nicholson (journals) found another nest, with one egg hatching. The breeding site in 1962 was on a man-made substrate: sand from the lake bottom had been pumped to fill in a 1.2 ha lowland along the shore of Lake Conway beside another lake close to a road.

3) Lake Underhill and Orlando Municipal Airport field, Orange County. Lake Underhill, a freshwater lake, is 8 km from Lake Conway. I found no breeding information from May 1930 (Howell 1932). Howell (1932) collected two egg sets of two eggs each at Orlando on 9 June 1930 (AMNH 16192-16193). No data slips accompany these egg sets (R. T. Chesser, *in litt.*). Howell accompanied the Nicholson brothers at Merritt Island, Brevard County, on 8 June 1930, but the Nicholson journals contain no information on 9 June. It is likely, however, that Howell collected his egg sets at Lake Underhill, since D. J. Nicholson (1938, 1942; egg slips) collected egg sets here on 19-20 June (DMNH 1642-1646; five clutches of two eggs each). The small colony (25-30 birds) contained ten active nests, two clutches of one egg each, the other clutches with two eggs each plus one deserted nest of two eggs; two partially feathered young also were present. This colony was located along the lake shore close to the Orlando Municipal Airport field, but the nesting substrate was man-made, of sandy fill dredged from the lake and deposited on shore (D. J. Nicholson journals). Another smaller colony (12-14 birds) was 400 m away, also on the lake shore, but no active nests were present on 19-20 June.

The Lake Underhill colony was probably active in 1929, when D. J. Nicholson saw Least Terns at the site, but he did not search for nests. This colony remained active every year through at least 1945 (Nicholson 1938, 1942, journals; egg slips; actual years for egg set data: 1930, 1937-1940). By 1937 the colony had shifted several hundred meters, from the shore of Lake Underhill to the edge of the airfield where about 50 pairs nested (Nicholson 1938). Fifty to sixty pairs also nested at this site from 1938-1940 (the five clutches collected from 15 May to July were of two eggs each, DMNH 1651-1652, 1665-1667). [Least Terns also nested at the Orlando Municipal Airport field in 1972 (Lohrer and Lohrer 1973; B. A. Anderson, *in litt.*)].

4) Puzzle Lake, Seminole County. Stevenson and Anderson (1994) cited Puzzle Lake as a breeding locality but gave no further details. Mason (1937) stated that 50 nests of Least Terns were reported here in 1932. The water at Puzzle Lake is brackish (DeMort 1990).

5) Lake Monroe, Seminole County. Stevenson and Anderson (1994) cited Lake Monroe, a freshwater lake (DeMort 1990), as a breeding locality but gave no further details. Mason (1937) stated that a colony of 100 pairs of Least Terns nested on man-made habitat (spoil bank) in Lake Monroe at Sanford in 1935.

6) Lake Okeechobee, Glades County. Nicholson (1948; journals) stated that Least Terns nested among a large colony of Gull-billed Terns (*Sterna nilotica*) at Lake Okeechobee, a freshwater lake, in 1943. Smith and Gore (1996) implied they interpreted the description (Nicholson 1948) of "small grassy islands bordered with a narrow fringe of sandy beach" to refer to natural habitat but the islands were man-made: both sandy and rocky islands were created by dredged-material (D. J. Nicholson, journals). Three pairs of Least Terns nested on the narrow beach of one or two small sandy islands, where D. J. Nicholson (journals) collected three egg sets (two sets of two eggs each, the other of three eggs) on 3 (not 7) June 1943. The breeding site was located at the end of a chain of islands which extended into the lake for 11-14 km, directly opposite Lakeport (Glades County) to the west. On 15 April and 22 May 1951 D. J. Nicholson (journals) again saw Least Terns on these islands.

7) A freshwater lake, probably Lake Sherwood about 12 km west of Orlando and about 2.5 km east of Minorville, Orange County. D. J. Nicholson discovered a colony of 20-25 pairs breeding along the sandy shore of a lake bisected by state highway 50. He collected a clutch of two eggs and another clutch of three eggs (DMNH 1781-1782) on 21

June 1948. He also found three other clutches (two of two eggs each, the other of one egg) on this date. On 6 and 22 June, W. H. Nicholson collected three egg sets of two eggs each (DMNH 1775, 1780; WFVZ 34289) on the sandy shore of a lake. He stated this colony was about 16 km west of Orlando, and contained about 50 pairs of Least Terns. Despite the discrepancies between their two accounts, a conservative interpretation is that the Nicholson brothers probably collected egg sets at the same colony. On 18 June 1962 D. J. Nicholson collected one clutch of two eggs (DMNH 1808) along highway 50 at the bottom of a 5 m grade near the lake shore. This colony contained four adult birds. Nicholson (journals) also found a larger colony (10-12 pairs) of Least Terns nesting at this site around 1956.

8) Turkey Lake, 10 km west-southwest of Orlando, Orange County. D. J. Nicholson (egg slips, journals) stated that Least Terns nested at Turkey Lake, a freshwater lake, but I have been unable to find any material documentation for this breeding site.

9) Mullet Lake, Seminole County. Davidson (1951) found three nests of Least Tern, each with one egg, in May 1951. The eggs had disappeared by 8 June. The habitat at Mullet Lake was a tongue of flat sandy shore close to the St. Johns River. The water at Mullet Lake is brackish (DeMort 1990).

W. H. Nicholson discovered 35 Least Terns at Lake Holden, Orlando, on 28 June 1933, which included one pair courtship feeding on a small grassy island. However, he stated the birds were not breeding. The Nicholson brothers (journals) also observed small numbers (≤ 5 birds) of Least Terns at other lakes in Orange County (also Flat Lake, Lake County) over the years (1928-1953) but never documented breeding at these localities.

Two (sites 7-8) of the nine enumerated breeding sites of Least Terns in the interior of the central peninsula of Florida from 1914 to the early 1960s were heretofore unknown. For the other two sites in Orange County, Nicholson (1938) mentioned that Least Terns had nested at Lake Conway but gave no other details and the Lake Underhill site is probably the locality referred to in Howell (1932). Four of five remaining sites are from Seminole County; the other was at Lake Okeechobee. All five localities had been cited in the literature but were not cited by Lohrer and Lohrer 1973; two references (Nicholson 1948, Davidson 1951) had emphasized breeding information on Gull-billed Terns. Data slips for egg sets and journals of the Nicholson brothers contributed significant new information for most of the seven enumerated localities which had been cited before.

Least Terns that nested in the interior of central Florida from 1914 to the early 1960s demonstrated flexibility in choice of breeding location. Other than Lake Okeechobee, the eight breeding localities can be divided into two groups, lakes of the St. Johns River system (Lakes Harney and Monroe, and Mullet and Puzzle lakes) and lakes of the central sandy ridge. The large shallow lakes of the St. Johns River system vary from fresh to brackish (DeMort 1990). For Least Terns breeding at brackish sites, the designation "inland" is somewhat misleading. In both groups plus Lake Okeechobee, Least Terns nested on man-made substrates. Data slips and journals of the Nicholson brothers provided information that positively identified the man-made substrate for several of these localities (e.g., Lake Okeechobee) that appeared to be of natural origin from the original citation. I am reluctant to conclude that some other breeding localities that may be of natural origin (e.g., "sandy shore", "sandy flat") are not man-made substrates because some man-made substrates were originally described as such. It is possible that Least Terns may nest along natural sandy shorelines of lakes in central Florida, especially during drought years when water levels are low. The positive determination of natural substrate for any Least Terns nesting at an inland locality in the central peninsula of Florida would have potential implications for how their historical breeding distribution could be interpreted.

Least Terns were more abundant and widespread as breeding birds in the interior of the central peninsula of Florida from 1914 to the early 1960s than heretofore appreciated. Regardless of the possibility that some colonies during this period may have been

on natural substrates (cf., McNair in press), Least Terns responded to the availability of man-made habitats that provided suitable nesting substrates. This increase in the interior coincided with recovery of coastal populations after the turn of the 20th century, but before coastal birds were heavily disturbed (Thompson et al. 1997). Least Terns may have nested in the interior of central Florida prior to decimation of Least Tern breeding populations in the late 19th century, but the only evidence we have from this period is the undetailed report from Lake Thonotasassa in 1887 (Howell 1932).

D. J. Nicholson died in 1964 (Sprunt 1965). Afterwards, Least Terns breeding in the interior of the central peninsula of Florida continued to nest on man-made substrates, including phosphate mines beginning in the mid-1960s (Tall Timbers Research Station archives for materials of Henry M. Stevenson) and roof-tops of buildings (Orange County) beginning in 1975 (Fisk 1978, Stevenson and Anderson 1994). Some colonies at these two habitats have been as large or larger (100-200 pairs, TTRS archives; cf., Maehr 1982) than the largest colonies here prior to the mid-1960s. The Florida breeding bird atlas (1986-1991) documented breeding colonies of Least Terns in the interior in seven counties; these colonies were concentrated in the central peninsula plus Lake Okeechobee (Gore 1996), which agrees with other material since the mid-1960s (Stevenson and Anderson 1994; TTRS archives). This recent distributional pattern is highly similar to the pattern documented by the Nicholson brothers and a few other individuals about 50 years before, although Least Terns now usually nest at more inaccessible sites (e.g., roof-tops) in response to greater human disturbance. Since observer effort has significantly increased recently compared to 50 years ago, I question the conclusion Least Terns have become more numerous and widespread as breeding birds in the central peninsula of Florida over the last several decades in response to the loss of natural habitat (sandy beaches) on the coast (Fisk 1978, Robertson and Woolfenden 1992, Gore 1996). This conclusion was made without adequate consideration of Least Tern breeding information from the central peninsula of Florida from 1914 to the early 1960s.

In summary, Least Terns nested at eight localities in the interior of the central peninsula of Florida (Orange and Seminole counties) plus one site at Lake Okeechobee from 1914 to the early 1960s. Breeding at two localities in Orange County was previously unknown. Data slips for Least Tern egg sets and journals of the Nicholson brothers also provided new breeding information for most other localities. Nesting on man-made substrates was confirmed but nesting on natural substrates is not considered proven beyond a reasonable doubt. Least Terns were more abundant and widespread as breeding birds in the interior of the central peninsula of Florida from 1914 to the early 1960s than heretofore appreciated. The perception that breeding Least Terns have become more numerous and widespread over the last several decades in this region is overstated, compared to their earlier breeding status.

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SUMMARY OF BREEDING ROSEATE TERNS IN THE FLORIDA KEYS: 1974-1998

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The Roseate Tern (*Sterna dougallii*) is listed as endangered in its northeastern range (USFWS 1989) and threatened in its Caribbean range (USFWS 1993). The general ecology and status of both populations also have been reviewed in Clapp et al. (1983) and Spendelow and Patton (1988). The status and distribution of nesting Roseate Terns in Florida have been reviewed by Robertson (1978) and Smith (1996). Nesting reports for the Florida Keys for the period 1962 through 1973 were reviewed and summarized by Robertson (1978); Smith (1996) summarized reports for the period 1984 through 1992 in the region. This note summarizes nesting reports for the period 1974 through 1998, including previously unpublished data, as well as documentation of a new rooftop colony on Vaca Key (Fig. 1 and Table 1).

Robertson (1978) reported four breeding areas from 1962 to 1973 for Roseate Terns in the Keys, apart from the established colony at Dry Tortugas. These included islands off Seven-mile Bridge, Crawl Key, spoil islands in Key West harbor, and Molasses Reef Dry Rocks. From a review of literature and our own field surveys we identified 12 breeding areas in the mainland Florida Keys from 1974 to 1998 (Fig. 1). Peak counts at these

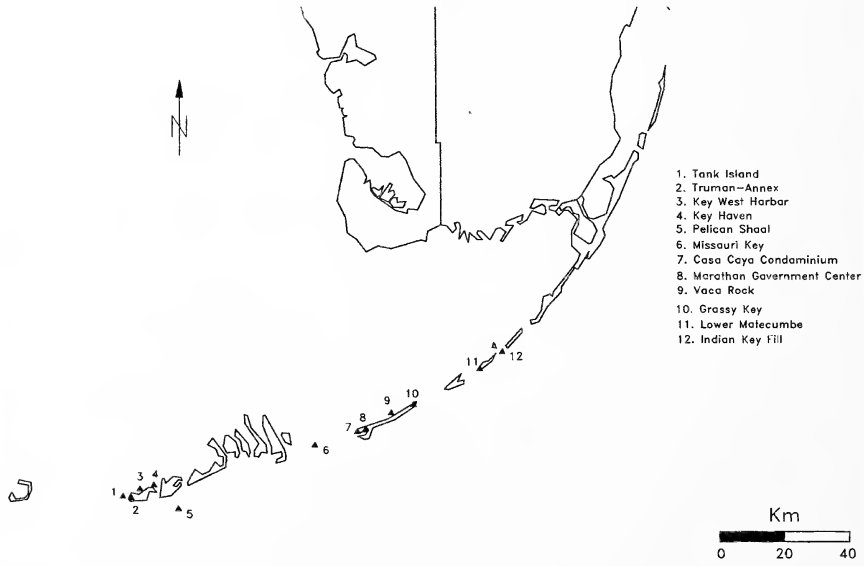

Figure 1. Caribbean Roseate Tern breeding colonies in the Florida Keys, 1974-1998.

Table 1. Summary of counts at breeding colonies for the Caribbean Roseate Tern in the Florida Keys, 1974-1998.

YEAR	ADULT COUNT	LOCATION	SOURCE
1974	4 pairs	Key Haven	Kale 1974
1975	10-12 pairs	Key Haven	Ogden 1975
1976	42 nests	Indian Key fill	Kushlan and White 1985
	65 nests	Grassy Key	Kushlan and White 1985
	263 nests	Key West tank farm island	Kushlan and White 1985
	25-30 pairs	Key West Harbor	Ogden 1976
1981	96 pairs	Near Lower Matecumbe Key	Paul 1981
1982	est. 75-100 pairs	Key West-Truman Annex roof	Kale 1982
	2 pairs	Missouri Key	Paul 1982
	est. 40 pairs	Key West-Truman Annex roof	Paul 1982
1984	100+[a]	Key West-Truman Annex roofs	Paul 1984
1985	est. 30 pairs	Key West Naval Air Station roof	Kale 1985
1987	est. 300 pairs	Pelican Shoal	Hoffman et al. 1993
1988	250-300 pairs	Key West-Tank Island	Paul 1988; Robson and Hovis, unpubl. data
1989	60 pairs	Marathon condominium roof	Kalla and Robson, unpubl. data
	225 pairs	Pelican Shoal	Kalla and Robson, unpubl. data
1990	est. 242 pairs	Pelican Shoal	Robson and Kalla, unpubl. data
	7 pairs	Marathon-Vaca Rock	Robson and Kalla, unpubl. data
	6 adults	Marathon-Casa Cayo Condominium	Robson and Kalla, unpubl. data
1991	est. 137 pairs	Pelican Shoal	Robson and Kalla, unpubl. data
	30 pairs	Marathon-Casa Cayo Condominium	Robson and Kalla, unpubl. data
1992	est. 278 pairs	Pelican Shoal	Robson, unpubl. data
	5 pairs	Key West-Truman Annex Bldg. #289 roof	Robson, unpubl. data
	6 pairs	Marathon-Vaca Rock	Robson, unpubl. data
1993	10 adults	Key West-Truman Annex Bldg. #289 roof	FNAI[b]/The Nature Conservancy 1994

[a] Count includes 25-30% flying young
[b] FNAI (Florida Natural Areas Inventory)

Table 1. (Continued) Summary of counts at breeding colonies for the Caribbean Roseate Tern in the Florida Keys, 1974-1998.

YEAR	ADULT COUNT	LOCATION	SOURCE
1995	520 adults	Pelican Shoal	Robson and Zambrano, unpubl. data
1996	1 pair	Vaca Key-Marathon Government Center roof	Robson and Zambrano, unpubl. data
	38 pairs	Key West-Truman Annex roof	Robson and Zambrano, unpubl. data
	325 adults	Pelican Shoal	Robson and Zambrano, unpubl. data
	9 adults	Marathon-Vaca Rock	Robson and Zambrano, unpubl. data
1997	162 pairs	Pelican Shoal	Robson and Zambrano, unpubl. data
	est. 25 pairs	Vaca Key-Marathon Government Center roof	Frank, unpubl. data
1998	est. 32 adults	Vaca Key-Marathon Government Center roof	Zambrano, unpubl. data
	est. 317 pairs	Pelican Shoal	Zambrano, unpubl. data

[a] Count includes 25-30% flying young
[b] FNAI (Florida Natural Areas Inventory)

colonies are summarized in Table 1. The surveys from 1988 through 1998 by the Florida Game and Fresh Water Fish Commission were ground counts of breeding birds conducted May-July. With few exceptions, possibly caused by inconsistencies in survey frequency and technique between 1974 and 1985, the estimated breeding population for the Florida Keys and Dry Tortugas has remained in the range of 150-300 pairs for the above period (Table 1). While this suggests that the population is stable, the number of breeding individuals is probably still too low to sustain genetic viability (Frankel and Soulé 1981).

In the northeastern states, most Roseate Terns tend to breed in a few large colonies with smaller numbers in nearby satellite colonies (USFWS 1989). Likewise, in the Keys, over 75% of the known population typically nested at a single location (e.g., Pelican Shoal). Main breeding sites tend to persist if conditions remain suitable (USFWS 1989). Additional information regarding colony turnover dynamics may be reviewed in Spendelow et al. (1995). Until the early 1970s, the Dry Tortugas was the primary Roseate Tern breeding area in Florida (Robertson 1964, 1978). Predators and nesting failures due to storm tides probably led to the gradual shifting of this colony to the Keys (Robertson 1978), with much of the activity occurring on spoil or otherwise denuded islands in the Key West area. For example, Tank Island adjacent to Key West became the main colony in 1976 after being cleared of vegetation. However, the site was not used in subsequent years until 1988 when the island was again cleared (Hoffman et al., 1993).

Deterioration of nesting conditions at Tank Island and other historic colony sites likely influenced the shift of a majority of the birds to Pelican Shoal in the late 1980s, although anecdotal reports from local fishermen suggest Roseate Terns may have nested there undetected prior to this time.

By 1998, only two colonies remained in the Florida Keys: Pelican Shoal and the Marathon Government Center roof colony on Vaca Key. The paucity of suitable, undisturbed habitat, coupled with a low population estimate, make the Roseate Tern population of the Florida Keys vulnerable to hurricanes, disease, oil spills, and human disturbance. Rodgers and Smith (1995) recommended 180 m as a buffer zone distance to minimize human disturbance to mixed Least Tern (*Sterna antillarum*) and Black Skimmer (*Rynchops niger*) breeding colonies; this recommendation may also be appropriate for Roseate Terns. Providing additional Roseate Tern nesting habitat and increasing protection and monitoring of known historic colony sites should be high priorities for management of Roseate Terns in Florida. Preliminary data collected in southeast Florida for Least Terns suggests that decoys can be effective in attracting terns to artificial and enhanced sites (Adams 1998; Smith, unpubl. data). Public stewardship also should be encouraged.

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THE STATUS OF ROSS'S GOOSE IN FLORIDA

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The first record of Ross's Goose (*Chen rossii*) in Florida was in 1987 (Robertson and Woolfenden 1992); since then, the species has occurred in Florida less than annually but with increasing frequency. The purpose of this note is to formally document another record of Ross's Goose and evaluate all its records or reports (*sensu* Robertson and Woolfenden 1992) in Florida. I place these occurrences from Florida within an historical and distributional context by including a summary of the recent winter range expansion of Ross's Goose to other states in the extreme southeastern United States east of the Mississippi Valley. Ryder and Alisauskas (1995) did not present this information.

I discovered an adult Ross's Goose at Apalachicola, Franklin County, on 16 Nov 1996. The bird arrived during a severe cold front. The Ross's Goose frequented a vacant lot near the tip of a small peninsula underneath the Gorrie Bridge at the mouth of the Apalachicola River, where it foraged on grasses and sedges. The bird honked once in response to an imitation of a Snow Goose (C. *caerulescens*) call. The Ross's Goose arrived alone, flew strongly, but eventually joined a mixed group of feral ducks alongside the river and became quite tame. The Ross's Goose remained at this location through 28 December, afterwhich the goose plus the entire group of ducks disappeared. The probable cause was poaching.

The smaller size, shorter tarsi and neck, rounded head, furrowed neck feathers, very slight arch in maxillary and mandibular tomia, short stocky bill where the feathers of lores met the base of the maxilla forming an almost straight line, and blue-green caruncles at the base of the bill, distinguished this Ross's Goose from a Snow Goose or a hybrid Ross's x Snow Goose. The identification of the Ross's Goose is verified by photographs (Tall Timbers Research Station Photo Collection P692-694; P695: Fig. 1). The Florida Ornithological Society Records Committee accepted this record (Florida Ornithological Society Archives 99-399; kept at the Florida Museum of Natural History, University of Florida, Gainesville).

The following are verified records of Ross's Goose that have appeared in Florida. The occurrences were of single birds.

(1) Adult, 22 December 1987, Leon County (Ogden 1988, Robertson and Woolfenden 1992, Anderson and Baker 1994, Stevenson and Anderson 1994). Photographs (FOSA 88-133). The bird occurred with a flock of Snow Geese.

(2) Adult, 10 December 1991, Leon County (Cox 1992, Ogden 1992, Robertson and Woolfenden 1992, Anderson and Baker 1994, Stevenson and Anderson 1994). Photographs (FOSA 92-252). The bird occurred with a flock of Snow Geese.

(3) Adult, 12 March to at least early December 1999, Crystal River, Citrus County (Pranty 1999c; B. Pranty, pers. comm.). Photograph (pers. exam. of photo website: http://www.photoloft.com/album). The goose has remained in back yards with feral Mallards (*Anas platyrhynchos*).

The following seven occurrences of Ross's Goose that have appeared in Florida lack supporting specimen or photographic documentation. All occurrences were of one to four birds.

(1) Adult, 8 November 1995, Leon County (Pranty 1996a).

(2) Adult, 9 November to 22 December 1996, Merritt Island N.W.R., Brevard County (Pranty 1997a,b). The bird was found dead about 22 December, but deposition of the specimen is unknown.

Figure 1. Adult Ross's Goose at Apalachicola, Franklin County, Florida, 16 November 1996. Note the short tarsi and neck, round head, very slight arch in maxillary and mandibular tomia, and short stocky bill where the feathers of lores meet the base of maxilla forming an almost straight line (see text for additional details). Photograph by T. E. Lewis (TTRS P695).

(3) One bird, 23 December 1996 to 12 January 1997, western Duval County (Pranty 1997b, West 1997). Photographs were purportedly submitted to the FOSRC, but the committee has not received these photos or evaluated this report (L. Atherton, *in litt.*). The bird occurred with a flock of Snow Geese.

(4) One bird, 1-5 December 1997, Leon County (Pranty 1998). Photographs were purportedly submitted to the FOSRC, but the committee has not received these photos or evaluated this report (L. Atherton, *in litt.*).

(5) Up to four birds (three adults, one immature), 18 November 1998 to 23 February 1999, Fort Walton Beach sewage treatment facility, Okaloosa County (Pranty 1999a,b). The small flock occurred with a much larger flock of Snow Geese.

(6) Two adults, 6-16 December 1998, Zellwood, Orange County (Pranty 1999b). The birds occurred with a large flock of Snow Geese.

(7) One bird, 21 December 1998, Shalimar, Okaloosa County (Pranty 1999b).

In two additional records, the identity of Ross's Goose was questionable.

(1) Immature, 1-24 Jan 1981, Taylor County (Stevenson 1981, Anderson and Baker 1994). Photograph (TTRS P318). The bird occurred with a flock of Snow Geese. Stevenson and Anderson (1994) stated the bird was probably a hybrid Ross's x Snow Goose or small Snow Goose, whereas Robertson and Woolfenden (1992) suggested they were more certain of its identification as a Ross's Goose.

(2) Adult, 18 February to 13 March 1996, Lake Woodruff N.W.R., Volusia County (Pranty 1996b, Langridge 1996). Published photograph (Langridge 1996). This bird was originally identified as a Ross's Goose. However, examination of the photograph suggests the bird is a hybrid Ross's x Snow Goose. The bird has several apparent intermedi-

ate characters: the bill is somewhat slender and elongated, the base of the maxilla forms a partial forward arch with the feathers of the lore, and the caruncles are barely visible (see figure 1 in Trauger et al. 1971). In addition, the neck appears proportionally longer and the head less rounded than in Ross's Goose.

Ryder and Alisauskas (1995) stated the frequency of hybrid Ross's x Snow Geese on the breeding range ranged between 1.9-4.7%. The occurrence of one hybrid and one bird of uncertain identity in Florida suggests that observers should not overlook the occurrence of hybrid Ross's x Snow Geese.

East of the Mississippi Valley in the extreme Southeast, the months and years of first occurrence (record or valid report) of Ross's Goose is as follows: Alabama (Dec 1982), Florida (Dec 1987), Georgia (Feb 1989), and South Carolina (Nov 1995) (Ortego 1983, Manns 1989, Ogren 1989, Robertson and Woolfenden 1992, Worthington 1997; G. D. Jackson, *in litt.*). All states have had additional occurrences, especially Alabama which now has had about 21 (Drennen 1988, Simbeck 1988, Parrish 1994, Bremser 1995, Miller 1998; G. D. Jackson, *in litt.*). This winter range expansion of Ross's Goose to the extreme southeastern United States in the late 1980s and 1990s is correlated with their recent population increase and range expansion southeastward on the breeding range (Ryder and Alisauskas 1995). Most Ross's Geese in the Southeast have been identified as adults although immature birds in late winter could be overlooked because only small patches of grayish wash may remain on head and mantle (cf., Parrish 1994; see Ryder and Alisauskas 1995).

In summary, Florida has four records of Ross's Goose, of which the bird at Apalachicola is the third. Seven additional occurrences have not been documented or evaluated by the FOSRC, although the identification of these birds is probably valid. All above occurrences have been since 1987, which is consistent with recent occurrences in other states of the extreme Southeast. One other occurrence in Florida was a record of an apparent hybrid Ross's x Snow Goose. The identity of the remaining occurrence is unresolved.

Acknowledgments.—I thank T. E. Lewis for donating photographs of Ross's Goose at Apalachicola to the TTRS photo collection, B. H. Anderson, L. Atherton, and T. Webber for providing information from the archives of the FOSRC, G. D. Jackson for providing information from Alabama, and B. H. Anderson and G. E. Wallace for their reviews of the manuscript.

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SWAMP SPARROW WINTER SITE FIDELITY RECORDS IN FLORIDA

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The status of grassland birds during the winter in the southeastern United States is a subject of increasing concern to biologists because of the degradation and loss of many of their habitats. The Swamp Sparrow (*Melospiza georgiana*) is a common species during the winter in the Southeast and a frequent co-dominant among grassland bird assemblages. Swamp Sparrows are a common winter resident in Florida, inhabiting emergent wetlands, savannas, and old fields (Stevenson and Anderson 1994). While their status appears to be stable, they may occur in the same habitat with grassland birds of management concern like Henslow's Sparrow (*Ammodramus henslowii*). Despite the abundance of Swamp Sparrows, winter site fidelity has not been documented in Florida. Researchers have documented winter site fidelity for a number of Neotropical migrants and have used site fidelity to emphasize the importance of resources on wintering habitats (Nickell 1968, Ely 1973, Woods 1975, Holmes and Sherry 1992). We document new information on winter site fidelity of Swamp Sparrows in Florida and other states of the Southeast. In Florida, we focus on the relationship of winter site fidelity and prescribed fire in two habitats, coastal cordgrass marsh and inland savannas.

While studying Black Rails (*Laterallus jamaicensis*) on the St. Johns National Wildlife Refuge (St. Johns), we (MLL, WCC, SAL) captured and banded five Swamp Sparrows in March of 1994. One Swamp Sparrow banded on 20 March 1994, was recovered on 5 January 1995, following a prescribed fire on the refuge. The banded bird was found dead in a burned cordgrass *(Spartina bakeri)* clump with standing water at the base. The bird had most of its feathers burned, but the aluminum leg band was intact. The recovery site was within 50 m of the original banding location. During banding operations on the Apalachicola National Forest (Apalachicola Ranger District), DBM captured and banded one Swamp Sparrow on 5 November 1995 and recaptured the same individual within 500 m on 19 November 1996; a second individual was captured and banded on 5 March 1996 and recaptured within 500 m on 3 November 1996, and a third individual was captured on 15 March 1996 and recaptured within 50 m on 30 November 1996. All six captures were in savannas burned within the previous four months to two years. These are the first Swamp Sparrow site fidelity records published from Florida.

We searched the USGS Bird Banding Laboratory (BBL) banding records from 1920 to 1999, and found records of seven birds banded in Florida during the winter, and recaptured in the same location one to two years later. Looking at the records for the entire Southeast, we located 20 additional cases of winter site fidelity, in two cases the banded birds were captured in the same location during three successive years. All the

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BBL winter site fidelity records for Swamp Sparrows were recorded between 1931 and 1956. Five additional instances of winter site fidelity were recorded from 1966 to 1997; however, those records were within the same winter, not year-to-year fidelity. More recently, winter site fidelity is known in Swamp Sparrows from Mississippi, where 25.9% (n = 27) of birds banded in January 1995 were recaptured in 1996 (R. Holberston pers. comm. *in* Mowbray 1997). Breeding site fidelity in Swamp Sparrow has been reported from Rhode Island, where 51.5% (n = 64) of banded birds returned from one breeding season to the next (Ellis 1980).

In Alabama, Henslow's Sparrows showed strong within winter site fidelity, but not year-to-year site fidelity (Plentovich et al. 1998). Plentovich et al. (1998) hypothesized that because of the three to five year burn cycle, the pine (*Pinus sp.*) dominated habitat is ephemeral, and the birds don't exhibit year-to- year site fidelity because of this disturbance. However, 8% of Henslow's Sparrows banded in 1995 (n = 90) at Apalachicola returned to the same two savannas in 1996 (D. McNair, unpubl. data). In addition, one Henslow's Sparrow banded in 1995 was recaptured in 1999, and another banded in 1996 was recaptured in 1999 in the same habitats which had been prescribed burned between the first capture and recapture periods (D. McNair unpubl. data). The St. Johns marsh is burned on a three to five year cycle, with approximately one third of the total marsh area burned each year to maintain the open cordgrass marsh. Site fidelity may indicate the uniqueness and relative importance of a habitat type on a regional or larger scale. Research is needed to investigate site fidelity at different scales to understand the importance of wetland disturbances like prescribed fire on wintering bird populations.

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STOMACH CONTENTS OF TWO NESTLING FLORIDA GRASSHOPPER SPARROWS

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In this note we describe the stomach contents of two nestling Florida Grasshopper Sparrows (*Ammodramus savannarum floridanus*). Information on diet may be helpful in evaluating food resources used by this endangered subspecies (USFWS 1988). We believe this is the first information on the stomach contents of nestling Grasshopper Sparrows.

On 19 May 1997, the carcass of a Florida Grasshopper Sparrow estimated to be nine days old was salvaged from a nest presumably destroyed by a predator at Three Lakes Wildlife Management Area, Osceola County (27°47'N 81°06'W). On 6 July 1997, the carcass of another nestling estimated to be three days old was salvaged from a flooded nest at Avon Park Air Force Range, Highlands County (27°37'N 81°19'W) (Pranty 2000). Stomachs were removed and preserved in 70% isopropyl alcohol. Stomach contents were examined with a dissecting microscope and identified to the lowest possible taxon. Contents were deposited in the Florida Museum of Natural History (UF 41164, UF 41165).

Orthopterans were the most important food for the two nestling Florida Grasshopper Sparrows, comprising 63% of the total number of food items and 71% of all arthropods consumed (Table 1). Previous information on foods used by Grasshopper Sparrows is limited to stomach samples from adults, and observations of adults feeding young. Insects, mostly grasshoppers, are the major summer diet of adults throughout the species' range (Vickery 1996). Insects and spiders comprised 69 percent, and vegetation comprised 31 percent of the stomach contents of nine adults and one "young" Florida Grasshopper Sparrow examined by Howell (1932), with grasshoppers, crickets, beetles and weevils, moths and their larvae, flies, and bugs taken in the greatest quantity. Vegetation included seeds of sedges, grasses, and stargrass (*Hypoxis* sp.). Wiens (1969) reported that Lepidopteran larvae were the most frequent food fed to nestling Grasshopper Sparrows (*A. s. pratensis*) in Wisconsin.

Food is usually not considered a limiting resource for opportunistic grassland birds (Wiens 1973, Wiens and Rotenberry 1979). However, Kaspari (1991) found that Grasshopper Sparrow (*A. s. pratensis*) nests with high food delivery rates produced more offspring. Low seed production may limit some wintering populations (Pulliam and Dunning 1987).

Grasshopper Sparrows are ground-dwelling birds, and bare ground is critical for effective foraging (Vickery 1996). The Florida subspecies occupies prairie grasslands maintained in an open, early successional stage by prescribed fire every 2-3 years (Delany et al. 1985). Grasshopper species composition and relative abundance varies with grassland vegetation (Kemp et al. 1990) and fire frequency (Evans 1984), and may affect prey availability for sparrows at some locations.

Table 1. Stomach contents of nestling Florida Grasshopper Sparrows from Three Lakes Wildlife Management Area[1] (Osceola County) and Avon Park Air Force Range[2] (Highlands County), 1997.

Item	Number of items	Percent of total number
INSECTS		
Katydid (*Orchelium* sp.)	5[1]	15.6
Grasshoppers (*Melanoplus* sp.)	2[2]	6.3
Scudder's mantis (*Oligonicella scudderi*)	1[2]	3.1
unidentified orthopterans	12[2,3]	37.5
Click beetle (*Elateridae*)	1[1]	3.1
Ground beetle (*Carabidae*)	1[1]	3.1
Two-lined spittlebug (*Prosapia bicincta*)	1[1]	3.1
Fly (*Tabanidae*)	1[1]	3.1
Parasitic wasp (*Braconidae*)	1[1]	3.1
ARACHNIDS		
Wolf spider (*Lycosa helluo*)	1[1]	3.1
Orb weaver spider (*Acantheperia venusta*)	1[1]	3.1
Jumping spider (*Habronattus calcaratus*)	1[2]	3.1
SEEDS		
Sedge (*Scleria* sp.)	1[1]	3.1
Unidentified seeds	3[1]	9.4
TOTAL	32	100.0

[3]Number estimated from pairs of mandibles.

Additional information on prey availability and diets of nestlings and year-round diets of adults is needed to assess food resources for Florida Grasshopper Sparrows. Information on food items reported here may be useful in designing sampling procedures for potential prey (e.g., sweep net samples for grasshoppers and pitfall traps for spiders).

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FIELD OBSERVATIONS

Fall Report: August-November 1999.—The observations listed here are reports of significant birds or numbers of birds reported to the Field Observations Committee (FOC). Reports submitted to the Committee should be in the following format: species, number of individuals, age and sex of the bird(s), color morph if applicable, location (including county), date, observer(s), and significance. Reporting seasons are winter (December-February), spring (March-May), summer (June-July), and fall (August-November). Submit reports to regional compilers within two weeks after the close of each season, or to the state compiler within one month. Reports sent via email are greatly preferred over those sent via regular mail. Addresses of the FOC members are found at the end of this report.

Sight-only observations are considered "reports" while only those supported by verifiable evidence (photographs, video or audio tapes, or specimens) are called "records." Species for which documentation is required by the FOS Records Committee (FOSRC) are marked with an asterisk (*). A county designation (in italics) accompanies the first-time listing of each site in this report; further listings of the same site lack the county name. Abbreviations used are as follows: CP = county park, ENP = Everglades National Park, EOS = end of season, FWBSTF = Fort Walton Beach STF (*Okaloosa*), HISRA = Honeymoon Island SRA (*Pinellas*), HPM = *Hamilton* phosphate mines, LARA = Lake Apopka Restoration Area (*Orange*; the former Zellwood muck farms), NWR = national wildlife refuge, PPM = *Polk* phosphate mines, PPSP = Paynes Prairie State Preserve (*Alachua*), SCCP = Saddle Creek CP (*Polk*), SLMP = San Luis Mission Park (*Leon*), SP = state park, SRA = state recreation area, SRSTF = Springhill Road STF (*Leon*), STF = sewage treatment facility, and N, S, E, W etc. for compass directions. Species names in bold face denote birds newly reported or verified in Florida.

Summary of the Fall Season

Hurricane *Dennis* grazed the Atlantic coast on 29-30 August, as did Hurricane *Floyd* on 14-15 September. Hurricane *Irene* crossed the middle peninsula the night of 15-16 October, pushing Magnificent Frigatebirds, Sooty and Bridled terns, and other species inland at several sites, and causing possibly the greatest fallout ever reported in Florida. From dawn to 1100 of 17 October at Canaveral National Seashore (*Volusia*), Cindy and Kurt Radamaker watched 100-200 birds per minute fly in from over the ocean and head north. They estimated that hundreds of thousands of birds passed by in a wave that extended for many miles along the coast. This wave was composed of Palm Warblers (approximately 70%), Blackpoll and Cape May warblers and Common Yellowthroats in the thousands, and Yellow-billed Cuckoos, Gray Catbirds, Black-throated Blue Warblers, and American Redstarts in the hundreds. Fifty Merlins were observed, and nearly every one carried a warbler in its talons. Later, at Smyrna Dunes Park the Radamakers photographed a female Kirtland's Warbler.

Wally George called the fall migration at Fort Lauderdale "remarkable" because the hurricanes "kept things stirred up." No weather-related fallouts were noted at Gainesville, but Rex Rowan reported that annual rainfall at Gainesville for 1999 was 43 cm below average, which allowed Paynes Prairie—flooded for the two previous years—to drain. This concentrated fish in small areas, and numbers of American White Pelicans, wading birds including hundreds of Wood Storks, and Bald Eagles were attracted to the area.

At Tallahassee, a similar event occurred when a sinkhole drained Lake Jackson, which brought in wading birds, shorebirds, and Short-eared Owls. At the Lake Apopka Restoration Area (i.e., the former Zellwood muck farms), Harry Robinson recorded 211

species of birds in 37 trips from 3 August to 29 October. An organized vulture/hawk watch at Curry Hammocks State Park recorded over 15,000 individuals of 16 species–including 22 Mississippi Kites—from mid-September through October.

FOSRC rarities reported this fall were Florida's first **Elegant Tern** at Honeymoon Island, a Cuban Pewee in *Palm Beach*, Tropical Kingbirds at Fort Lauderdale and Miami, the Kirtland's Warbler at New Smyrna, and a Chestnut-collared Longspur at Fort Pickens. Other interesting reports were a **Black Crowned Crane** (Florida's most recent exotic) at Pembroke Pines, a Brant specimen from the Middle Keys, a Golden Eagle at Tallahassee, another White-crowned Pigeon in the western Panhandle, increasing reports of White-winged Doves in the peninsula, including 23 at Trenton, a Short-eared Owl in Osceola County in early August, the Golden-crowned Kinglet "invasion" of the northern half of the peninsula, a Bananaquit at Fort Lauderdale, and a Stripe-headed Tanager at Miami.

Species Accounts

Common Loon: 8 at Lake Santa Fe (*Alachua*) 10 Oct (T. Crisman); 1 at PPSP 17 Oct (R. Rowan).

Eared Grebe: 1 in breeding plumage at FWBSTF 6 Aug-21 Oct (B. Duncan, E. Case, H. Horne et al.); 1 at SRSTF 18 Sep-19 Oct (G. Menk et al.); 1 at LARA 19 Oct-12 Nov (H. Robinson et al., photos by H. Weatherman to FOC); 1 at Caspersen Beach (*Sarasota*) 14-15 Nov (J. Kopitzke, C. Sample); 3 at HPM 21 Nov (R. Rowan et al.); 1 at PPM 27 Nov (P. Timmer, C. Geanangel).

Audubon's Shearwater: 3 at Fort Pickens (*Escambia*) 13 Oct and 2 there 20 Oct (both B. Duncan).

Leach's Storm-Petrel: 2 off St. Augustine Beach (*St. Johns*) 16 Oct (D. Goodwin).

American White Pelican: 124 at PPM 19 Sep (P. Timmer, C. Geanangel); 13 at Ocklawaha Restoration Area (*Marion*) 27 Sep (E. Scales); 1 at Curry Hammocks SP (*Monroe*) 10 Oct (D. Lovitch et al.); at least 65 at PPSP 23 Oct-EOS (A. Kratter et al.); 100 at Hillsborough Bay (*Hillsborough*) 24 Oct (A. Schnapf); 14 at Lake Jackson (*Leon*) 30 Oct-EOS (L. Betts et al.); 7 at HPM 20 Nov (B. Bergstrom et al.).

Great Cormorant: 1 immature seen from Guana River SP (*St. Johns*) 16 Nov (N. Wamer).

Anhinga: 1 at Curry Hammocks SP 24-25 Oct (D. Lovitch et al.); 300 at PPSP 2 Nov (A. Kratter).

Magnificent Frigatebird: 1 over Bald Point SP (*Franklin*) 11 Oct (J. Dozier); 11 over Sebring (*Highlands*) 16 Oct (R. Bowman, C. Wilson); 5 over Lorida (*Highlands*) 16 Oct (L. and P. Gray); 1 over Nassau Sound (*Nassau*) 16 Oct (P. Leary).

American Bittern: 1 at LARA 31 Aug (H. Robinson).

Great Blue Heron: 350 at PPSP 2 Nov (A. Kratter).

"Great White Heron:" 1 W of Fellsmere (*Indian River*) 10 Sep (S. Rowe).

Great Egret: 400 at Lake Jackson 4 Sep and 700 there 8 Oct (both G. Menk et al.); 219 at PPSP 9 Oct (H. Adams).

Snowy Egret: 125 at PPSP 28 Oct (A. Kratter).

Little Blue Heron: 150 at PPSP 28 Oct (A. Kratter).

Reddish Egret: 3 immatures at St. Marks NWR (*Wakulla*) 14 Aug-3 Sep (H. Horne, J. Dozier et al.).

Cattle Egret: 4500 at a sod farm in N Jacksonville (*Duval*) 4 Oct (R. Clark).

Black-crowned Night-Heron: 17 at Lake Jackson 16 Oct (G. Menk).

White Ibis: 400 at PPSP 28 Oct (A. Kratter).

Glossy Ibis: 7 at St. Petersburg (*Pinellas*) 28 Aug (L. Snyder); 150 at Gainesville (*Alachua*) 7 Aug (R. Rowan); 3 at SRSTF 13 Sep (J. Cavanagh); 3 at Lake Jackson 6 Nov (G. and S. Hampton); 1 at Cedar Key (*Levy*) 28 Oct (D. Henderson).

ROSEATE SPOONBILL: 1 at LARA 20-31 Aug (H. Robinson); 1 at Newnans Lake (*Alachua*) 15 Sep (J. Hintermister, M. Manetz); 6 at PPM 19 Sep (C. Geanangel, P. Timmer); 4 S of Fellsmere 28 Sep (S. Rowe); 1 immature at Lake Jackson 6 Oct (D. Harder); 2 at PPSP 26 Nov-EOS (D. Hartman, H. Adams).

WOOD STORK: 350 at Lake Jackson 5 Sep (G. Menk, J. Erickson); 666 at PPSP 30 Oct (H. Adams).

TURKEY VULTURE: 1000 over Nassau Sound 17 Oct (P. Leary).

FLAMINGO SPECIES: 2 at agricultural fields near Loxahatchee NWR (*Palm Beach*) in late Aug or early Sep were thought to be Chilean Flamingos; one bird had a yellow band with a black "21" on its right leg (M. Bailey et al., photo to FOC).

GREATER FLAMINGO: 24 (16 adults) at Snake Bight, ENP (*Monroe*) 21 Nov (J. Boyd).

FULVOUS WHISTLING-DUCK: 366 at LARA 10 Aug (H. Robinson); 30 at Broadmoor Marsh (*Brevard*) 29 Nov (S. Rowe).

BLACK-BELLIED WHISTLING-DUCK: 1 at Pembroke Pines (*Broward*) 24 Aug (K. and K. Schnitzius, photos to FOC); 2 at LARA 25-27 Aug and 3 there 31 Aug (both H. Robinson); 1 at PPSP 10 Sep (R. Rowan); 6 at Valrico (*Hillsborough*) 10 Nov (S. Gross); 3 shot at HPM 20 Nov (*fide* J. Krummrich); 1 at Broadmoor Marsh 29 Nov (S. Rowe); 15 in *Polk* through the season (C. Geanangel, P. Timmer).

SNOW GOOSE: 1 at Guana River SP 12 Nov (D. Meehan); 5 at Cedar Key 17 Nov (D. Henderson); 10 at St. Marks NWR 18 Nov (D. Harder); up to 45 at Lake Jackson 19-22 Nov (G. Hampton); 1 at HPM 20 Nov (B. Bergstrom et al.); 23 at PPSP 23 Nov-EOS (S. Borderieux, B. Simons); 12 at LARA 26-30 Nov (H. Robinson); 9 at Hernando Beach (*Hernando*) 26-29 Nov (C. Black, B. Hansen); 2 at Broadmoor Marsh 29 Nov (S. Rowe).

BRANT: 1 at Curry Hammocks SP 17 Oct was picked up 25 km farther "south" the next day and died two days later (*fide* D. Lovitch, specimen to Archbold Biological Station).

GREEN-WINGED TEAL: 1 at LARA 20 Aug and 4500 there 9 Nov (both H. Robinson); 300 at Broadmoor Marsh 29 Nov (S. Rowe).

AMERICAN BLACK DUCK: up to 2 at LARA 16 Nov-EOS (H. Robinson).

MOTTLED DUCK: 197 at LARA 20 Aug (H. Robinson).

MALLARD: resident at LARA, with 40 birds there 19 Nov (H. Robinson); 1 pair at Keaton Beach (*Taylor*) 7 Aug (R. Paul).

BLUE-WINGED TEAL: 3 at Gainesville 5 Aug (P. Burns); 2 at LARA 6 Aug and 7300 there 15-16 Nov (both H. Robinson); 1500 at PPSP 26 Oct (A. Kratter); 1500 at Broadmoor Marsh 29 Nov (S. Rowe).

CINNAMON TEAL: 1 immature male at FDCP 7-11 Sep (L. Atherton et al., photos by L. Snyder to FOC); 1 male at LARA 29 Oct-12 Nov (H. Robinson et al.).

NORTHERN SHOVELER: 3000 at PPM 27 Nov (P. Timmer, C. Geanangel).

GADWALL: 222 at LARA 22 Nov (H. Robinson); 277 at PPM 27 Nov (P. Timmer, C. Geanangel); 75+ at SRSTF 29 Nov (G. Menk).

GREATER SCAUP: up to 3 at LARA 12 Nov-EOS (H. Robinson); 3 males at SRSTF 27 Nov (G. Hampton).

LESSER SCAUP: 2 near the Alafia River (*Hillsborough*) 4 Aug (R. Paul, A. Schnapf).

COMMON EIDER: 1 adult male at Port Canaveral (*Brevard*) 19 Aug-early Oct (T. Fiorello et al.); 1 immature male at Port Canaveral 19 Nov (D. Novier).

SURF SCOTER: 2 at Hanna Park (*Duval*) 2 Nov (N. Wamer); 1 female at Walsingham Park (*Pinellas*) 10-11 Nov (J. Fisher et al.); 8 at Sanibel Island (*Lee*) 16 Nov (W. Dirks).

WHITE-WINGED SCOTER: 1 at Hanna Park 17 Nov (N. Wamer); 1 at PPM 27 Nov (P. Timmer, C. Geanangel).

BLACK SCOTER: 8 at St. Marks NWR 14-20 Nov (D. Morrow and B. Bergstrom); 180 in "several large flocks" off Guana River SP 18 Nov (N. Wamer).

TURKEY VULTURE AND RAPTORS: The following table shows the cumulative totals of daily surveys by staff of Hawkwatch International at Curry Hammocks SP near Marathon (*Monroe*) 14 Sep-31 Oct (D. Lovitch, J. Martinez-Climent, C. Lott). The "Gross" col-

umn refers to the total number of individuals counted per species; the "Net" column represents the Gross total *minus* "northbound" birds in an attempt to avoid counting the same individual twice. The "Day" column represents the highest daily gross count, and the "Date" column gives the date of the highest count.

Species	Gross	Net	Day	Date
Turkey Vulture	3,554	2,050	871	24 Oct
Osprey	1,130	766	105	26 Sep
Swallow-tailed Kite	6	6	4	18 Sep
Mississippi Kite	22	22	16	5 Oct
Bald Eagle	20	2	3	4 dates
Northern Harrier	811	765	150	18 Oct
Sharp-shinned Hawk	4,788	4,136	874	18 Oct
Cooper's Hawk	503	345	76	24 Oct
Red-shouldered Hawk	36	28	5	23 Sep
Broad-winged Hawk	5,209	1,363	848	18 Oct
Short-tailed Hawk	19	13	4	24 Oct
Swainson's Hawk	35	27	7	23 Oct
Red-tailed Hawk	3	1	1	3 dates
American Kestrel	3,846	3,520	597	16 Oct
Merlin	1,023	665	72	3 Oct
Peregrine Falcon	1,750	1,402	158	18 Oct
Totals	**22,755**	**15,111**		

Swallow-tailed Kite: 27 at Lettuce Lake Park (*Hillsborough*) 13 Aug (K. Tracey).

White-tailed Kite: 2 seen regularly SW of Palm Bay to 12 Oct (S. Rowe); up to 8 at West Kendall through the season (*fide* J. Boyd).

Snail Kite: 2 at Lake Woodruff NWR (*Volusia*) 8 Aug (D. Green).

Mississippi Kite: 1 at Disney Wilderness Preserve (*Osceola* or *Polk*) 9 Oct (B. Cooper, S. Farnsworth).

Bald Eagle: 15 over Nassau Sound 17 Oct (P. Leary); 2 at FWBSTF throughout the season (B. Duncan et al.).

Northern Harrier: 1 at LARA 10 Aug, and 173 there 26 Oct (both H. Robinson); 1 at Micanopy (*Alachua*) 21 Aug (J. Hintermister, M. Manetz).

Sharp-shinned Hawk: 1 at FWBSTF 3 Aug (D. Ware, L. Fenimore); 6 at LARA 6 Aug, where birds summered (H. Robinson).

Broad-winged Hawk: 15 at Sanibel Island 16 Oct (J. Greenlaw, C. Ewell et al.).

Short-tailed Hawk: 1 dark morph carrying a grackle at Orlando 28 Aug (J. Clifton); 1 light morph at SCCP 18 Sep (C. Geanangel, P. Timmer); 1 dark morph at Weekiwachee Preserve (*Hernando*) 7 Sep (A. and B. Hansen); 1 dark morph over Avon Park Air Force Range (*Polk*) 14 Sep (B. Pranty); 1 at LARA 30 Sep (H. Robinson).

Swainson's Hawk: 1 in *Hillsborough* 8 Nov (D. Wassmer).

Red-tailed Hawk: 1 immature "Krider's Hawk" at Ocklawaha (*Marion*) 16 Nov (E. Scales); 1 "Krider's Hawk" at Tram Road STF (*Leon*) 16 Nov (B. Bergstrom); 1 "Harlan's Hawk" in *Santa Rosa* 16 Nov (L. Duncan); 1 adult "Krider's Hawk" SW of Palm Bay (*Brevard*) 29 Nov (S. Rowe).

Golden Eagle: 1 adult eating carrion at Lake Jackson (*Leon*) 22 Oct (J. Cavanagh).

Crested Caracara: 1 E of Christmas (*Orange*) 13 Nov (A. and B. Hansen).

American Kestrel: 1 at Tram Road STF 26 Aug (K. MacVicar); 24 at Sanibel Island 9 Oct (C. Ewell, W. Dirks); 245 at Guana River SP 17 Oct between 0945-1220 (N. Wamer); 199 over Nassau Sound 17 Oct (P. Leary).

Merlin: 53 at Nassau Sound 17 Oct (P. Leary); 25 at Guana River SP 17 Oct (N. Wamer).

PEREGRINE FALCON: 3 at Tram Road STF 18 Sep (*fide* G. Menk); 368 at Guana River SP during 27 Sep-12 Oct, with 86 birds 8 Oct (B. Stoll); 4 at LARA 12 Oct (H. Robinson); 30 at Nassau Sound 17 Oct (P. Leary).

NORTHERN BOBWHITE: 20 at West Kendall 1 Aug (J. Boyd).

YELLOW RAIL: 1 heard at FWBSTF 10 Aug (L. Duncan); 1 at HPM 17 Oct (K. Avera).

BLACK RAIL: 2 heard at Boyce-Werner Gulf Coast Preserve, Bayonet Point (*Pasco*) 10 Aug (D. Robinson).

SORA: 3 at FWBSTF 14 Aug (D. Ware, A. Knothe).

PURPLE GALLINULE: up to 15 at LARA to 19 Oct (H. Robinson).

COMMON MOORHEN: 1245 at LARA 10 Sep (H. Robinson).

SANDHILL CRANE: 25 over Alligator Point 22 Oct (J. Dozier); 1 at Cedar Key 16 Nov (D. Henderson); 1 over Tram Road STF 17 Nov (J. Cavanagh, B. Henderson); 4 at St. Marks NWR 18 Nov (D. Harder); 18 at Lake Jackson 30 Nov (M. Collins).

WHOOPING CRANE: 2 at Broadmoor Marsh 19 Nov (S. Rowe).

BLACK CROWNED CRANE (*Balearica pavonia*): 1 near Pembroke Pines 28-31 Aug, submitted without details (*fide* D. and H. Hull), was the first Florida report.

BLACK-BELLIED PLOVER: up to 15 at Lake Jackson 27 Sep-EOS (G. Menk, D. Harder et al.); up to 3 at PPSP 28 Oct-20 Nov (A. Kratter, M. Manetz).

AMERICAN GOLDEN-PLOVER: up to 3 at N Jacksonville 31 Aug-4 Oct (R. Clark); up to 6 at LARA 8 Sep-26 Nov (H. Robinson); singles at SRSTF 15 Sep (J. Cavanagh, J. LaVia) and 22 Oct (J. Cavanagh); 1 at Shell Key (*Pinellas*) 18 Sep (P. Blair, L. Snyder); 1 at Huguenot Park (*Duval*) 17 Oct (R. Clark).

SNOWY PLOVER: 8 (5 young) at North Lido Beach (*Sarasota*) 2 Aug (B. Parker).

WILSON'S PLOVER: 1 at Curry Hammocks SP 17 Sep (D. Lovitch et al.).

AMERICAN OYSTERCATCHER: 2 at Fort Pickens 7 Sep (B. Duncan); 162 W of Crystal River 2 Sep (T. Rogers); 200+ at Yankeetown (*Levy*) 11 Nov (C. Black).

BLACK-NECKED STILT: up to 78 at Talbot Island SP 2-26 Aug (R. Clark); 3 at FDCP 8 Sep (P. Blair); 1 at HPM 8-19 Nov (J. Krummrich); 23 at PPM 27 Nov (P. Timmer, C. Geanangel).

AMERICAN AVOCET: 1 at LARA 27 Aug (H. Robinson); 13 at Lake Jackson 15 Sep (D. Harder, G. Menk); 3 at Huguenot Park 22 Sep (N. Wamer); 2 at Alligator Point 23 Oct (J. Dozier); 1 at PPSP 5-10 Nov (B. Muschlitz et al.); 3 at St. Marks NWR 18 Nov (D. Harder); 350 at PPM 27 Nov (P. Timmer, C. Geanangel).

SOLITARY SANDPIPER: 1 at Orlando Wetlands Park (*Orange*) 5 Aug (K. and L. Tracey); 3 at FDCP 7 Sep (L. Atherton); 1 at Gainesville 27 Nov (B. Simons, R. Rowan).

WILLET: 200 W of Crystal River 2 Sep (T. Rogers).

SPOTTED SANDPIPER: 1 at Hague Dairy (*Alachua*) 25 Nov (L. Davis).

UPLAND SANDPIPER: 6 at LARA 3 Aug (H. Robinson); 1 at HISRA 6 Oct (C. Paine, C. Pierce, K. Radamaker).

LONG-BILLED CURLEW: 1 at Huguenot Park 2-30 Aug (R. Clark); 1 at HISRA 13 Aug-EOS (L. Kenney et al.); 4 at Alafia Bank (*Hillsborough*) 17 and 22 Sep (R. Paul et al.); 1 at Three Rooker Bar (*Pinellas*) 29 Sep (P. Blair).

HUDSONIAN GODWIT: 1 at Boca Raton (*Palm Beach*) 16 Oct (B. and J. Hope).

BAR-TAILED GODWIT: 1 at Huguenot Park 1-24 Oct (R. Clark et al., photos to FOC).

RUDDY TURNSTONE: 1 at Lake Jackson 16 Sep (D. and K. MacVicar).

RED KNOT: 600 at Fort Myers Beach (*Lee*) 12 Aug (C. Ewell); 1 at LARA 30 Nov (H. Robinson).

SANDERLING: 8 at SRSTF 18 Sep (*fide* G. Menk).

WHITE-RUMPED SANDPIPER: 1 at FWBSTF 15 Sep (D. Ware); 1 at Lake Jackson 30 Sep-4 Oct (D. Harder et al.); 1 at Big Talbot Island SP (*Duval*) 9 Oct (J. Hintermister, M. Manetz); 1 in *Wakulla* 14 Nov (J. Dozier).

BAIRD'S SANDPIPER: 1 at SRSTF 31 Oct (P. Conover, J. Cavanagh, D. and S. Jue).

Pectoral Sandpiper: 6 at Carillon 3 Aug (J. and L. Hopkins); 6 at Orlando Wetlands Park 5 Aug (K. Tracey); 25 at St. Petersburg 28 Aug (L. Snyder); 390 at N Jacksonville 4 Oct (R. Clark).

Purple Sandpiper: 10 at Smyrna Dunes Park (*Volusia*) 28 Nov (S. Backes, L. Albright).

Dunlin: 1 in mostly breeding plumage at Tierra Verde (*Pinellas*) 28 Aug (J. Bouton, C. Ewell); 1 at Lake Jackson 8 Sep (G. Menk); 2 at PPSP 26 Oct (A. Kratter).

Stilt Sandpiper: 1 at West Kendall 22 Aug (J. Boyd); 80 at SRSTF 18 Sep (P. Conover); 8 at PPSP 2 Nov (A. Kratter).

Buff-breasted Sandpiper: 12 at LARA 13 Aug (H. Robinson); 2 at N Jacksonville 3 Sep (R. Clark); 1 at Belle Glade (*Palm Beach*) 5 Sep and 2 there 10 Sep (both B. and J. Hope); 1 at SRSTF 14 Sep (J. Cavanagh, J. LaVia); up to 26 at Lake Jackson 15 Sep-8 Oct (J. Cavanagh, G. Menk et al.); 1 at Curry Hammocks SP 21 Sep (D. Lovitch).

Ruff: 1 female at Belle Glade 10 Sep (B. and J. Hope).

Short-billed Dowitcher: up to 4 at LARA 10-27 Aug, and 2 there 26 Nov (both H. Robinson); 17 at PPSP 26 Oct (A. Kratter).

Long-billed Dowitcher: 1 at SRSTF 4 Aug (J. Cavanagh); 1 immature heard at West Kendall 22 Aug (J. Boyd); up to 474 at LARA 2 Oct-EOS (H. Robinson).

American Woodcock: 1 at Tallahassee (*Leon*) 14 Nov (L. Thompson).

Wilson's Phalarope: 1 at Navarre Flats (*Santa Rosa*) 10 Aug (B. and L. Duncan); singles at SRSTF 14 Aug and 29 Aug (G. Menk, K. MacVicar); 1 at LARA 20-25 Aug (H. Robinson).

Red-necked Phalarope: 1 at Indian Rocks Beach (*Pinellas*) 26 Aug died the next day (P. Maldoner, specimen to Archbold Biological Station).

Pomarine Jaeger: 9 at Guana River SP 26 Nov (N. Wamer); 10 at Sebastian Inlet (*Brevard* and *Indian River*) 3 Oct (D. Simpson).

Long-tailed Jaeger: 1 adult at Fort Pickens 9 Aug (B. Duncan).

Jaeger species: 1 at Fort Pickens 11 Sep (B. Duncan).

Laughing Gull: 4700 at Huguenot Park 8 Aug (R. Clark).

Franklin's Gull: 1 immature at Pensacola Beach (*Escambia*) 11 Oct (A. Sheppard); 1 at Dunedin Causeway (*Pinellas*) 15 Oct (E. Kwater); 1 at Redington Beach (*Pinellas*) 23 Nov-EOS (L. Atherton et al.).

Herring Gull: 5 at Lake Weir (*Marion*) 15 Sep after Hurricane *Floyd* (E. Scales).

Lesser Black-backed Gull: 1 at Three Rooker Bar 29 Sep (P. Blair); 1 adult at Redington Beach 12 Nov-EOS (K. Nelson et al.); 1 in S *Pinellas* 17 Nov-EOS (L. Atherton et al.); 2 at Snake Bight, ENP 21 Nov (J. Boyd).

Great Black-backed Gull: 2 at Shell Key 18 Sep (P. Blair, L. Snyder); 1 immature at Egmont Key (*Hillsborough*) 9 Aug (M. Delgrasso).

Gull-billed Tern: 5 at Lake Weir 22-25 Aug, and 6 there 15 Sep (both E. Scales); 3 at Curry Hammocks SP 21 Sep (D. Lovitch et al.); 1 at Dunedin Causeway 17 Oct (R. Smith); 1 at Green Key CP (*Pasco*) 29 Oct-4 Nov (K. Tracey, photos to FOC); 1 at Cedar Key 27 Nov (T. Taylor); up to 3 at Blue Heron STF (*Brevard*) 12-14 Nov (B. Pranty et al., photos by L. Snyder to FOC).

Caspian Tern: 2 at PPSP 21 Sep (J. Hintermister, R. Rowan, G. McDermott); 101 at LARA 26 Nov (H. Robinson).

Royal Tern: 1850 at Huguenot Park 8 Aug (R. Clark); 1 at LARA 8 Sep (H. Robinson); 3 or more in *Polk* this fall (T. Palmer, C. Geanangel, P. Timmer).

*Elegant Tern (*Sterna elegans*): 1 at HISRA 3 Oct-22 Nov (E. Kwater, W. Yusek et al., photos by L. Snyder and B. Pranty to FOC) was the first record for Florida.

Sandwich Tern: 68 at Huguenot Park 8 Aug (R. Clark); 554 at PPM 21 Aug (C. Geanangel); 250 along Campbell Causeway (*Hillsborough*) 18 Sep (R. Webb).

Common Tern: 4000 at HISRA 3 Oct (E. Kwater).

Forster's Tern: 500 at HISRA 3 Oct (E. Kwater).

LEAST TERN: 2 at Key West (*Monroe*) 15 Aug were called "late" (J. Ondrejko); 225 along Campbell Causeway (*Pinellas*) 1 Aug (A. and R. Smith); 1 at Dunedin Causeway 16 Oct (J. King, E. Kwater et al.).

BRIDLED TERN: 1 adult at Huguenot Park 17 Oct (R. Clark).

SOOTY TERN: 1 at Huguenot Park 10 Aug (R. Clark); 3 at PPSP 15 Sep (J. Hintermister, M. Manetz, H. Adams); 20 at Lake Weir 15 Sep (E. Scales).

BLACK TERN: 100 along Campbell Causeway (*Pinellas*) 4 Aug (R. Webb), 300 there 13 Aug (P. Blair, J. and L. Hopkins), and 600 there 25 Sep (E. Kwater et al.); 347 at Huguenot Park 15 Sep (R. Clark).

BLACK SKIMMER: 250 at PPM 21 Aug (C. Geanangel).

WHITE-CROWNED PIGEON: 1 at Allen Beach (*Walton*) 14-15 Aug (G. Belling et al.) was called the third report for the W Panhandle.

WHITE-WINGED DOVE: singles at FDCP 4 Aug and 1 Sep (both L. Atherton); 3 at LARA 13-18 Aug (H. Robinson); 1 at Port Richey (*Pasco*) 15 Aug (K. Tracey); singles at Gainesville 19 Aug and 12-13 Nov (C. Romagosa, M. Manetz); 1 at S Jacksonville 21 Aug (N. Yudin); 1 at Spring Hill (*Hernando*) 27-29 Aug (A. and B. Hansen); 1 at Titusville (*Brevard*) "on a regular basis" in Aug (S. Rallo); 23+ at Trenton (*Gilchrist*) 3 Oct-EOS (J. Stephens, R. Rowan et al.); 2 at Cedar Key 14-30 Oct (D. Henderson, R. Rowan); 3 at Curry Hammocks SP 25 Oct (D. Lovitch et al.); 1 at St. Marks NWR 28 Oct (J. Cavanagh); 1 at HISRA 4-18 Nov (L. Atherton, K. Allen, P. Blair); 2 at Lutz (*Hillsborough*) 20 Nov (J. Hartzler); 1 at Lake Jackson 24 Nov (J. Cavanagh); 1 at Spring Hill 25 Nov, where 4 wintered last year (C. Black).

MOURNING DOVE: 1500 in one field at PPM 21 Aug (C. Geanangel).

PARROTS: over 300 at the Fort Lauderdale (*Broward*) roost 23 Oct included "lots" of begging juveniles. Birds identified specifically were 159 Red-crowned Parrots, "dozens" of Orange-winged Parrots, and single Yellow-headed and Yellow-naped parrots (S. Epps).

ROSE-RINGED PARAKEET: 8 at Naples (*Collier*) 1 Sep (K. Tracey).

BLACK-BILLED CUCKOO: 1 at Spanish River Park (*Palm Beach*) 6 Sep (B. and J. Hope); 1 at St. George Island SP (*Franklin*) 30 Sep (J. Cavanagh); 1 at LARA 30 Sep (H. Robinson); 1 at PPSP 27 Oct (R. Rowan).

YELLOW-BILLED CUCKOO: 40 at St. George Island SP 30 Sep (J. Cavanagh); 12 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

SMOOTH-BILLED ANI: 4 at West Lake Park, Hollywood (*Broward*) 12 Aug (W. George); 3 near Naranja (*Miami-Dade*) 27 Oct (D. Lovitch).

GROOVE-BILLED ANI: 1 at FWBSTF 25 Nov (L. Wanamaker).

SHORT-EARED OWL: 1 at Three Lakes WMA (*Osceola*) 3 Aug (T. Dean); singles at LARA 23 Oct and 26 Nov (both H. Robinson); up to 3 at Lake Jackson 22 Nov-EOS (G. and S. Hampton, J. Cavanagh et al.); up to 5 at West Kendall 24 Nov-EOS (J. Boyd et al.).

WHIP-POOR-WILL: 3 at Boyd Hill Nature Park, St. Petersburg 31 Oct (R. Smith).

CHIMNEY SWIFT: 1510 at LARA 2 Oct (H. Robinson).

BUFF-BELLIED HUMMINGBIRD: 1 banded bird returned to a feeder at Cantonment (*Escambia*) 15 Sep for its 5th winter (B. Kenney); singles at Pensacola 16 Oct (M. J. Pfeiffer) and 15 Nov (*fide* B. Duncan).

ARCHILOCHUS SPECIES: singles in *Leon* 9 Nov (F. Rutkovsky) and 28 Nov (H. Hooper).

RUFOUS HUMMINGBIRD: 1 immature male at Lakes Park (*Lee*) 2-22 Nov (L. Atherton, A. Salcedo et al.); 1 at St. Marks NWR 27-28 Nov (L. and R. Smith et al.).

SELASPHORUS SPECIES: 1 at S Jacksonville 16-24 Oct (N. Wamer); 2 at Gainesville 22 Nov-EOS (B. Roberts).

RED-HEADED WOODPECKER: 1 at Bonner Park, Largo (*Pinellas*) 18 Sep (J. Fisher et al.); 1 immature at FDCP 28 Oct (L. Atherton).

HAIRY WOODPECKER: 1 at LARA 27 Aug (H. Robinson).

EASTERN WOOD-PEWEE: 1 at Bonner Park 17 Aug (L. Atherton et al.); 52 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

*Cuban Pewee: 1 at Gumbo Limbo Nature Center (*Palm Beach*) 29 Sep-1 Oct (J. and T. Gire et al.).

Yellow-bellied Flycatcher: 2 at SLMP 22-23 Sep (G. Hampton, D. Harder, J. Cavanagh); 1 calling at Spanish River Park 3-4 Oct (B. Hope et al.); 1 at SCCP 10 Oct (C. Geanangel, P. Timmer et al.).

Acadian Flycatcher: 1 at SCCP 11 Aug (R. Webb, B. Ahern, J. Hartzler); 1 calling at High Taylor Birch SRA (*Broward*) 27 Sep (W. George et al.).

"Traill's" Flycatcher: 1 at PPSP 18 Sep (A. Kratter).

Least Flycatcher: 1 at FDCP 22 Sep (L. Atherton et al.); 1 at Black Swamp 17 Sep (G. Menk); 1 at St. George Island SP 30 Sep (J. Cavanagh).

Empidonax species: 15 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

Eastern Phoebe: 107 at LARA 29 Oct (H. Robinson).

Vermilion Flycatcher: 1 female at FWBSTF 30 Sep-2 Nov (B. and L. Duncan et al.); 1 female at LARA 19 Oct (H. Robinson); 1 at Micanopy 2 Nov-EOS (P. Burns et al.); 1 female at Goodwin WMA (*Brevard*) 12-14 Nov (T. Hince, E. Meleg et al.).

Ash-throated Flycatcher: 1 at Black Swamp 10 Nov (J. Cavanagh et al., sketch to FOC).

Brown-crested Flycatcher: 1 at the Iori Building, ENP (*Miami-Dade*) 23 Oct (J. Boyd et al.).

La Sagra's Flycatcher: 1 at Spanish River Park 18 Oct (B. and J. Hope).

*Tropical Kingbird: 1 at Birch SRA 11 Oct (W. George, S. Epps, L. Thompson); 1 at Coral Gables 24 Oct (M. Wheeler, D. Wright et al.).

Western Kingbird: 1 at Bald Point SP 6 Oct (J. Dozier); 1 at Cedar Key 17 Oct (D. Henderson); 1 at Curry Hammocks SP 27 Oct (D. Lovitch et al.); 2 at HISRA 30 Oct (K. Nelson), 1 stayed until 7 Nov (R. Smith); 1 at Merritt Island NWR 10 Nov (E. Kwater).

Eastern Kingbird: 200 at FDCP 7 Sep (L. Atherton et al.); 2 at Tallahassee 25 Oct and 1 there 9 Nov (G. Menk).

Gray Kingbird: 1 at LARA 13-18 Aug (H. Robinson); 15 at Cedar Key 23 Aug (J. Hintermister); 14 at MINWR 28 Aug (J. Hintermister); 1 at Curry Hammocks SP 30 Oct (D. Lovitch et al.).

Scissor-tailed Flycatcher: singles at Gulf Breeze (*Santa Rosa*) 28 Aug and 3 Oct (both B. Duncan); 1 at the FIND site (*Brevard*) 20 Sep (D. Stuckey); 1 at St. Marks NWR 8 Oct (D. and S. Jue); 1 at FWBSTF 14 Oct (B. Duncan, E. Case); 1 at Fort Pickens 24 Oct (B. Duncan et al.); 1 at LARA 26 Oct (H. Robinson); up to 3 at Seven Springs (*Pasco*) 1 Nov-EOS (D. Robinson, K. Tracey et al., photos to FOC).

Bell's Vireo: 1 at Spanish River Park 10 Oct (B. Hope); 1 at Lloyd SRA 19-20 Oct (W. George, S. Epps, J. DiPasquale).

Philadelphia Vireo: 1 at Gainesville 2 Sep (A. Kratter); singles at SLMP 22 Sep and 11 Oct (J. Cavanagh, D. Harder); 1 at Tallahassee 2 Oct (D. Harder, D. Jue); singles at Spanish River Park 2 Oct and 8 Oct, and 3 there 10 Oct (all B. Hope et al.); 1 at SCCP 10 Oct (C. Geanangel, P. Timmer, L. Albright, T. Palmer); 1 at Bonner Park 13 Oct (J. Fisher); 1 at FDCP 14 Oct (L. Atherton); 1 at Cedar Key 14 Oct (D. Henderson); 1 at LARA 14 Oct (H. Robinson); 1 at Dunedin Hammock Park (*Pinellas*) 16 Oct (K. Nelson et al.); 1 at Fort Lauderdale (*Broward*) 16-17 Oct (W. George, B. and T. Center); 1 at West Kendall 17 Oct (J. Boyd).

Horned Lark: 1 calling over Huguenot Park 23 Oct (N. Wamer).

Tree Swallow: 1 at LARA 6 Aug (H. Robinson).

Bank Swallow: 3 at FDCP 17 Aug (L. Atherton et al.) and 15 there 11 Sep (L. Snyder); 1 at Newnans Lake 21 Aug (J. Hintermister); 29 at LARA 6 Sep (H. Robinson).

Cliff Swallow: 300 at West Kendall 1 Aug (J. Boyd); 1 at FDCP 17 Aug (L. Atherton et al.); 4 at Newnans Lake 29 Aug (M. Meisenburg); 8 at Shell Key 18 Sep (L. Snyder); 68 at LARA 25 Sep (H. Robinson); 1 at Sanibel Lighthouse Park (*Lee*) 25 Sep (W. Winton, W. Dirks, C. Ewell); 1 at SRSTF 29 Oct (G. Menk).

Cave Swallow: 50 at West Kendall 6 Aug (J. Boyd).

Barn Swallow: 832 at LARA 20 Aug, and 515 there 10 Oct (both H. Robinson); 200 at FDCP 8 Sep (J. Bouton); 5 at SRSTF 3 Nov and 1 there 13 Nov (both G. Menk).

Carolina Chickadee: 1 at LARA 9 Nov (H. Robinson).

Red-breasted Nuthatch: 1 at O'Leno SP (*Columbia*) 14 Nov (M. Meisenburg, L. Davis); 1 at Gainesville 20 Nov (A. Kratter).

Brown Creeper: 1 at Cedar Key 24 Oct (D. Henderson); 1 at San Felasco Hammock 24 Oct (L. Davis); 1 at Black Swamp 19 Nov (D. Harder).

House Wren: 1 at Lake Marion Creek WMA (*Polk*) 22 Aug (C. Geanangel); 1 singing at Black Swamp 13 Sep (G. Menk); 210 at LARA 26 Nov (H. Robinson).

Winter Wren: 1 at Black Swamp 18 Oct (G. Menk); 1 at SLMP 1 Nov (D. Harder); 1 at Gainesville 20 Nov (M. Manetz).

Sedge Wren: 1 at FWBSTF 18 Sep (D. Ware, V. Spizak); 49 at LARA 26 Nov (H. Robinson).

Marsh Wren: 41 at LARA 26 Nov (H. Robinson).

Golden-crowned Kinglet: "abundant throughout" the E Panhandle (G. Menk), with the first report of 2 at SLMP 21 Oct (D. Harder); 3 at Cedar Key 27 Oct-6 Nov (D. Henderson); 2 at Alachua (*Alachua*) 30 Oct (P. Burns); 3 at HISRA 4-9 Nov (E. Kwater et al.); 5 at O'Leno SP 8-9 Nov (P. Burns, J. Hintermister et al.); 3 at Gainesville 12 Nov (M. Manetz); 1 at Bay Pines Park, St. Petersburg 13 Nov (J. Fisher); 3 at PPSP 14 Nov (M. Manetz); 2 at Walsingham Park (*Pinellas*) 16 Nov (J. Fisher); 2 at Sawgrass Lake CP 19 Nov (R. Smith, L. and J. Hopkins); 4 at HPM 21 Nov (P. Burns et al.); 2 at Hanna Park 29 Nov (N. Wamer).

Blue-gray Gnatcatcher: 2 at FDCP 1 Aug (L. Atherton); 3 at Key West 8 Aug (J. Ondrejko).

Eastern Bluebird: 1 at HISRA 4 Nov (L. Atherton, K. Allen).

Veery: 18 at Sawgrass Lake CP 18 Sep (M. Wilkinson).

Wood Thrush: 1 at John U. Lloyd SRA (*Broward*) 18-20 Oct (S. Epps, J. DiPasquale); 1 at Largo 18 Oct (J. Fisher); 1 at LARA 19 Oct (H. Robinson).

Gray Catbird: 1 at Lake Marion Creek WMA 22 Aug (C. Geanangel).

Cedar Waxwing: 1 at FDCP 9 Sep (L. Atherton, K. Tracey); 1 at Black Swamp 12 Nov (G. Hampton).

Blue-winged Warbler: 8 at Newnans Lake 4 Sep (J. Hintermister); 2 at SCCP 11 Sep and 18 Sep (L. Albright, T. Palmer) and 16 Oct (L. Albright, C. Geanangel); 17 in *Alachua* 18 Sep, including 10 at PPSP (A. Kratter et al.); 2 at MINWR 18 Sep (R. Paxson, R. Bird); 24 in *Pinellas* during 19 Sep-12 Oct (*fide* R. Smith), with 9 at FDCP 2 Oct (L. Atherton et al.); 1 at Birch SRA 25 Sep (*fide* W. George); 1 male at Fort Drum MCA (*Indian River*) 28 Sep (S. Rowe); 1 at SLMP 30 Sep (J. LaVia).

Golden-winged Warbler: 12 in *Alachua* during 20 Aug-17 Oct (R. Rowan et al.); 2 at SCCP 7 Sep (R. Webb) and 2 Oct (L. Albright, B. Haddad, R. Harper, B. Snow), and 1 there 16 Oct (L. Albright, C. Geanangel); 25 in *Pinellas* during 9 Sep-12 Oct (*fide* R. Smith), with 5 at FDCP 2 Oct (L. Atherton, M. Wilkinson C. Buhrman); 1 at Spanish River Park 19 Sep (B. and J. Hope et al.); 1 at Turkey Creek Sanctuary (*Brevard*) 24 Sep and 2 females there 5 Oct (both B. and S. Hills); 2 at Fort Drum 28 Sep (S. Rowe); 1 male at Sanibel Lighthouse 28-29 Sep (W. Winton, D. Beeler et al); 1 at Roosevelt Preserve (*Duval*) 2 Oct (N. Wamer).

Vermivora hybrid: 1 "Brewster's Warbler" at Birch SRA 18-22 Sep (*fide* W. George); 1 "Brewster's Warbler" at Colohatchee Park, Fort Lauderdale 18 Sep (W. George); 1 "Lawrence's Warbler" at Roosevelt Preserve 2 Oct (N. Wamer).

Tennessee Warbler: 1 at SLMP 9 Sep (J. Cavanagh); 4 at Spanish River Park 18 Sep (B. Hope, D. Robbins); 63 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman); 1 at Lakes Park 11 Nov (D. Wassmer, L. Saul, C. Ewell).

Orange-crowned Warbler: 3 at FWBSTF 22 Sep (D. Ware).

Nashville Warbler: 1 at S Jacksonville 9 Sep (N. Wamer); 1 at Black Swamp 10 Sep (D. Harder); 1 at Spanish River Park 18 Sep (B. Hope, D. Robbins); 2 at FDCP 23 Sep

(L. Atherton); 1 in *Wakulla* 7 Oct (J. Dozier); 1 in Tallahassee 9 Oct (P. Conover); 1 at Birch SRA 11-13 Oct (W. George, A. Esmas).

Northern Parula: 25 at SCCP 3 Aug (L. Albright); 64 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

Yellow Warbler: 5 at Philippe CP (*Pinellas*) 1 Aug (A. and R. Smith); 60 at FWBSTF 6 Aug (B. Duncan, E. Case); 15 at FDCP 16 Aug (L. Atherton, P. Blair); 57 at LARA 25 Aug (H. Robinson).

Chestnut-sided Warbler: seen in "above average numbers" at Birch SRA 4 Sep-24 Oct, with 5 there 18 Sep (*fide* W. George et al.); 2 at SCCP 7 Sep (R. Webb) and 4 there 2 Oct (L. Albright, B. Haddad, R. Harper, B. Snow); 3 at MINWR 18 Sep (R. Paxson, R. Bird); 28 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman); 3 at Turkey Creek Sanctuary 6 Oct. (B. and S. Hills).

Magnolia Warbler: 17 at PPSP 18 Sep (A. Kratter); 8 or more at Sanibel Lighthouse Park 18 Sep (C. Ewell, T. Doyle et al.); 5 at SCCP 2 Oct (L. Albright, B. Haddad, R. Harper, B. Snow).

Cape May Warbler: 3 at FDCP 23 Sep (L. Atherton); 2 at SCCP 16 Oct (L. Albright, C. Geanangel); 1 at Dunedin Hammock 16 Oct (P. Blair, J. and L. Hopkins, K. Nelson); 4 in *Alachua* 23 Oct-6 Nov (A. Kratter et al.).

Black-throated Blue Warbler: 1 at Bonner Park 23 Aug (L. Atherton, J. Fisher); 17 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman); 30+ at SCCP 16 Oct. (L. Albright, C. Geanangel).

Black-throated Green Warbler: 4 at Turkey Creek Sanctuary 6 Oct (B. and S. Hills).

Blackburnian Warbler: 1 at Black Swamp 19 Aug (D. Harder); of "hundreds" in *Pinellas* this fall were 50+ at Sawgrass Lake CP 8 Sep (R. Smith, M. Wilkinson) and 25 there 18 Sep (J. and L. Hopkins); 2 at LARA 2 Oct (H. Robinson).

Pine Warbler: 6 at LARA 29 Oct (H. Robinson).

*Kirtland's Warbler: 1 at Smyrna Dunes Park (*Volusia*) 17 Oct (C. and K. Radamaker, photos to FOSRC) apparently was only the second verifiable Florida record.

Prairie Warbler: 13 at LARA 17 Sep (H. Robinson); 1 male at S Jacksonville 25 Oct-EOS (P. Powell).

Palm Warbler: 2 at Alligator Point 14 Sep (J. Dozier); 1 at Lake Jackson 15 Sep (G. Menk, D. Harder); 870 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

Bay-breasted Warbler: 1 at Tallahassee 10 Sep (F. Rutkovsky); 4 at West Kendall 17 Oct (J. Boyd).

Blackpoll Warbler: 1 at Turkey Creek Sanctuary 8 Oct. (B. and S. Hills); singles at Birch SRA 10 Oct and 22-23 Oct (*fide* W. George); 1 at Cedar Key 16 Oct (D. Henderson); 2 at Bonner Park 16 Oct (L. Atherton, A. and T. Mason); 2 at PPSP 17-20 Oct (R. Rowan, L. Davis, D. Beatty); 2 at West Kendall 17 Oct (J. Boyd).

Cerulean Warbler: 1 at Colohatchee Park 19 Aug (W. George); 5 in *Alachua* during 21 Aug-18 Sep (J. Hintermister, M. Manetz et al.); 13 in *Pinellas* during 7-18 Sep (*fide* R. Smith), with 3 at Sawgrass Lake CP 7-9 Sep (B. Hoffman et al.); 1 at SCCP 2 Oct (L. Albright, B. Haddad et al.).

American Redstart: 1 at Sawgrass Lake CP 1 Aug (J. and L. Hopkins); 195 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman); 1 adult male at Gainesville 12 Nov-EOS apparently was wintering in the same yard where a male wintered the past two years (M. Manetz); 1 at SLMP 21 Nov (D. Harder).

Worm-eating Warbler: 8 at FDCP 8 Sep (J. Bouton); 1 at LARA 8 Oct (H. Robinson).

Swainson's Warbler: 3 at Bonner Park 6 Sep (P. Blair, J. Fisher); singles at Birch SRA 11 Sep, 22 Sep, 26 Sep, 6 Oct, and 16 Oct (*fide* W. George); 2 at MINWR 18 Sep (R. Paxson, R. Bird); 2 at Turkey Creek Sanctuary 19 Sep (B. and S. Hills et al.); 6 at Bill Baggs/Cape Florida SRA (*Miami-Dade*) 25 Sep (J. Boyd, L. Manfredi); 1 at Largo 10 Oct (J. Fisher).

Ovenbird: 1 at Boyd Hill Nature Park 7 Aug (R. Smith).

NORTHERN WATERTHRUSH: 1 at Bonner Park 6 Aug (K. Nelson); 7 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

LOUISIANA WATERTHRUSH: 1 at Sanibel Lighthouse 8-11 Aug (W. Dirks, C. Ewell); 1 at Highlands Hammock SP (*Highlands*) 28 Aug sang 7 full songs, possibly in response to the tape recording of an Eastern Screech-Owl call that was being played (B. Pranty, L. Albright); 1 at Tallahassee 4 Oct (F. Rutkovsky).

KENTUCKY WARBLER: 1 at SCCP 18 Aug (M. Chakan, J. Rudd); 4 at Bonner Park 23 Aug (L. Atherton, J. Fisher); 1 at Curry Hammocks SP 18 Sep (D. Lovitch et al.); 1 at Turkey Creek Sanctuary 26 Sep (D. Novier).

MOURNING WARBLER: 1 at FWBSTF 7 Sep (D. Ware); singles at Spanish River Park 18 Sep (B. Hope, D. Robbins) and 1 Oct (B. Hope).

HOODED WARBLER: 1 male at Morris Bridge Park (*Hillsborough*) 4 Aug (B. Ahern); 1 at Cedar Key 2 Nov (D. Henderson).

WILSON'S WARBLER: 1 at Sanibel Lighthouse 10-11 Sep (V. McGrath, C. Ewell); singles at Birch SRA 24 Sep (W. George) and 6 Oct (A. Esmas, A. and M. Stickel); 1 at PPSP 5 Oct (R. Rowan); 1 at Guana River SP 16 Oct (P. Powell); 1 male at SLMP 7 Nov-10 Dec (D. Harder et al.); 1 at West Kendall 24 Nov (J. Boyd).

CANADA WARBLER: 1 at Newnans Lake 13 Aug (L. Manfredi, R. Rowan); 1 at PPSP 31 Aug (R. Rowan); 1 at Columbia City (*Columbia*) 28 Aug (J. Krummrich); 1 at Crawfordville (*Wakulla*) 1 Sep (R. Christen); 1 at FDCP 7 Sep (L. Atherton); 1 at Bonner Park 8 Sep (J. Fisher); 1 at Spanish River Park 19 Sep (B. and J. Hope et al.); 1 at PPSP 24-27 Sep (M. Garner, B. Cooper et al.); 1 male at Fort Drum Creek (*Okeechobee*) 4 Oct (S. Rowe).

YELLOW-BREASTED CHAT: 1 at Spanish River Park 18 Sep (B. Hope, D. Robbins); 1 at Seminole (*Pinellas*) 1 Oct (J. Fisher); 1 at Birch SRA 4 Oct (W. George); 1 at ENP (*Miami-Dade*) 21 Nov (J. Boyd).

BANANAQUIT: 1 at Birch SRA 28 Sep-EOS (W. George et al.).

SUMMER TANAGER: 41 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

SCARLET TANAGER: 1 at Tallahassee 13 Sep (F. Rutkovsky); 4 at Turkey Creek Sanctuary 19 Sep and 5 Oct, and 5 there 9 Oct (all B. and S. Hills et al.); 25 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman); 4 at SCCP 7 Oct (C. Geanangel).

WESTERN TANAGER: 1 at Gulf Breeze 15 Aug (B. and L. Duncan); 1 at FDCP 27 Sep (L. Atherton et al.); 1 at Cedar Key 17 Nov (D. Henderson).

STRIPE-HEADED TANAGER: 1 male at A. D. Barnes Park (*Miami-Dade*) 29-30 Sep (C. and L. Manfredi et al.).

BACHMAN'S SPARROW: 1 at Birch SRA 25-27 Sep was called the first *Broward* report in over 20 years (*fide* W. George).

CLAY-COLORED SPARROW: 1 at Bald Point 7 Sep (J. Dozier); 1 at Spanish River Park 1 Oct (B. Hope); 1 at PPSP 2-5 Oct (P. Polshek, R. Rowan, J. Hintermister); 1 at Guana River SP 3 Oct (R. Rowan); 1 at Birch SRA 7 Oct (W. George, S. Epps, F. Jeter); 1 at FWBSTF 18-21 Oct (D. Ware, B. and L. Duncan et al.); 1 at ENP (*Miami-Dade*) 23 Oct (*fide* J. Boyd); 1 at Fort Pickens 26-27 Nov (B., L., and S. Duncan et al.).

FIELD SPARROW: 1 of the *arenacea* race at Mashes Island Park (*Wakulla*) 28 Nov (R. Smith).

VESPER SPARROW: 1 in N *Okaloosa* 18 Sep (L. Fenimore, L. Wanamaker); 1 at PPSP 17 Oct (R. Rowan, D. Beatty, L. Davis); 1 at West Kendall 6 Nov (J. Boyd).

LARK SPARROW: singles at LARA 18 Aug and 30 Sep-6 Oct (both H. Robinson); 1 at Birch SRA 8 Sep (W. George, A. and M. Stickel); 1 at Fort Pickens 18 Sep-7 Oct (P. Tetlow, L. Duncan et al.); singles at Guana River SP 22 Sep and 16 Oct (both P. Powell); 1 at Homestead (*Miami-Dade*) 23 Oct (*fide* J. Boyd); 1 at FWBSTF 28 Oct (L. Duncan et al.).

GRASSHOPPER SPARROW: 3 at West Kendall 20 Oct-EOS (J. Boyd).

HENSLOW'S SPARROW: 1 at West Kendall 28 Oct (J. Boyd, excellent details to FOC); 1 at Gainesville 21 Nov (M. Manetz).

Le Conte's Sparrow: 1 at PPSP 6 Nov (M. Garner); 4 at HPM 19-21 Nov (J. Krummrich, G. Hart et al.); 1 at Lake Jackson 26 Nov (G. Menk) and 2 there 27 Nov (D. Harder, G. Beaton).

Nelson's Sharp-tailed Sparrow: 2 at Shell Key 23 Sep (P. Blair); 1 at SRSTF 19 Oct (G. Menk).

Lincoln's Sparrow: 1 at SRSTF 23 Sep (G. Menk); 1 at Hague Dairy (*Alachua*) 8 Oct (R. Rowan); 3 at Fort Pickens 24 Oct (B. and P. Tetlow); 1 at PPSP 14 Nov (M. Manetz).

White-throated Sparrow: singles at LARA 19 Oct and 3 Nov (both H. Robinson).

White-crowned Sparrow: 1 at Lake Jackson 20 Oct (G. Menk); 1 at Bald Point 22 Oct (J. Dozier); 1 at ENP (*Miami-Dade*) 23 Oct (*fide* J. Boyd); singles at West Kendall 23 Oct and 24 Nov (both J. Boyd); 1 at SRSTF 24 Oct (G. Menk).

Dark-eyed Junco: 1 at Gainesville 20 Nov-EOS (D. Beatty).

*Chestnut-collared Longspur: 1 at Fort Pickens 31 Oct-2 Nov (D. Harder, P. Baker, A. Knothe et al.).

Snow Bunting: 1 female at Guana River SP 11-21 Nov (P. Donolo).

Rose-breasted Grosbeak: 1 immature at Tallahassee 17 Sep (F. Rutkovsky).

Black-headed Grosbeak: 1 immature male at Gulf Breeze 17 Sep (B. and L. Duncan).

Blue Grosbeak: 17 at FDCP 2 Oct (L. Atherton, M. Wilkinson, C. Buhrman).

Indigo Bunting: 25 at LARA 19 Oct (H. Robinson).

Painted Bunting: 1 at Lutz (*Pasco*) 20 Aug (D. Bowman); 1 in *Citrus* 25 Aug (T. Rogers); 1 at Newnans Lake 18-24 Sep (R. Rowan).

Dickcissel: 1 at Gulf Breeze 20 Aug (B. Duncan); 1 at Molino (*Escambia*) 18 Sep (G. Fleming); 1 at LARA 2 Oct (H. Robinson); 1 at Fort Pickens 6 Oct (L. Duncan et al.); 1 at Hague Dairy 22 Oct (R. Rowan).

Bobolink: 3000+ in agricultural fields at West Kendall 11 Sep (J. Boyd); 2 at FDCP 11 Sep (L. Snyder); up to 12 birds at Curry Hammocks SP 16-25 Sep (D. Lovitch et al.); 1 at SRSTF 24 Oct (G. Hampton).

Red-winged Blackbird: 1 fledgling being fed by an adult at Key West 18 Aug (J. Ondrejko).

Yellow-headed Blackbird: 1 male at Sanibel Lighthouse 12 Sep (V. McGrath, C. Ewell); 1 at PPM 19 Sep (C. Geanangel, P. Timmer); 1 at Naples 24-25 Sep (E. Pickens); 3 at Hague Dairy 8-10 Oct (R. Rowan) and 1 there 9 Nov (J. Hintermister); 1 at Fort Pickens 18 Oct (S. and S. Tagatz); 1 at Sarasota (*Sarasota*) 23 Nov (B. Parker, J. Palmer).

Rusty Blackbird: 1 at Black Swamp 26 Nov (D. Harder).

Brewer's Blackbird: 1 at FWBSTF 15 Sep (D. Ware); 7 at Black Swamp 16 Nov (G. Menk).

Shiny Cowbird: 2 at Cedar Key 9 Aug (D. Henderson); 1 female at HPM 20 Nov (B. Bergstrom, B. Passmore); 12 at Sarasota 23 Nov (B. Parker, J. Palmer).

Orchard Oriole: 1 at Gainesville 4 Sep (R. Rowan).

Baltimore Oriole: 1 female at Bald Point 29 Aug (D. Morrow); 1 male at HISRA 29 Aug (J. Bouton, C. Ewell); 8 at Crystal River (*Citrus*) 6 Sep (T. Rogers); 17 at "Ding" Darling NWR (*Lee*) 6 Sep (J. Bouton, C. Ewell, A. Salcedo); 4 at HISRA 10 Sep (P. Blair); 3 at LARA 23 Sep (H. Robinson); 4 at Turkey Creek Sanctuary 7 Oct (B. and S. Hills).

Bullock's Oriole: 1 male at Cedar Key 22-26 Oct (D. Henderson et al.).

House Finch: 180 in *Alachua* 18 Sep (*fide* M. Manetz); 2 at Spring Hill 7-8 Nov (S. Collins, A. and B. Hansen); 1 at Cedar Key 18-23 Nov (D. Henderson).

Orange Bishop: up to 3 females and 3 males at South Venice (*Sarasota*) mid-Aug-10 Nov (*fide* C. Sample, photos to FOC).

Nutmeg Mannikin: 8 at West Kendall 13 Nov (J. Boyd).

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Spring 1999 reports not published previously: Black-bellied Whistling Duck: 16 at Stick Marsh (*Indian River*) 1 Mar (Sean Rowe); Snail Kite: at least 13 at Blue Cypress Water Management Area (*Indian River*) 21 Apr (S. Rowe); Red-tailed Hawk: 1 adult and 1 immature "Krider's Hawks" S of Palm Bay (*Brevard*) 2 Feb (S. Rowe); Peregrine Falcon: "several" birds observed regularly chasing ducks and coots flushed by airboats at St. Johns Marshes (*Brevard* and *Indian River*) in spring (S. Rowe); Whooping Crane: up to 6 that wintered at Broadmoor Marsh (*Brevard*) remained to 12 Apr (S. Rowe); Buff-breasted Sandpiper: 1 at Stick Marsh 8 May (Judy Bryan); Smooth-billed Ani: 1 at Stick Marsh 22 Apr (S. Rowe); Tropical/Couch's Kingbird: 1 at Stick Marsh 26 Feb-26 Mar never called but "appeared very large-billed" (S. Rowe); Gray Kingbird: 1 at St. Johns Marsh Conservation Area (*Brevard*) 26 Mar (S. Rowe); Grasshopper Sparrow: 1 at Fort Drum Marsh Conservation Area (*Indian River*) 28 Apr (S. Rowe); and Bobolink: 50 at St. Johns Marsh Conservation Area 22 Apr, and 40 there 10 May (both S. Rowe).

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NOTICE

The Florida Important Bird Areas (IBA) program requests the assistance of FOS members to help identify those sites most important for maintaining the diversity, abundance, and distribution of the state's avifauna. This goal includes protecting the habitats of rare species, as well as "keeping common birds common." FOS members also are asked to help monitor bird populations at selected IBA sites, to update existing bird lists, and to compile lists for new areas.

Florida's IBA program is modeled after successful programs in Europe and the Middle East, and more recently, efforts in Pennsylvania and New York. Sites nominated as IBAs will vary considerably in size, but usually will be distinguished from surrounding areas by habitat or ornithological significance. Generally, an IBA should be large enough to supply all the needs of the targeted species during its residence onsite, although a few sites (e.g., wading bird rookeries) may not meet this definition. Sites that are privately owned may be nominated as IBAs if there is some assurance of long-term conservation management, and usually with the cooperation of the landowner. IBAs exclude from consideration all feral or exotic birds. However, the presence of these birds will not affect the acceptability of a nominated site. In addition, IBAs generally exclude sites that are heavily disturbed or artificially created (e.g., pastures, phosphate mines or landfills), but a few spoil islands that support significant populations of nesting wading birds or larids will be considered.

A nine-month nomination period is underway, and will end 31 October 2000. All sites nominated as potential IBAs must meet the criteria of at least one of four primary categories for site selection, and must be completed on the official IBA nomination form. The criteria for site selection, instructions, and the nomination form may be downloaded from the Florida IBA website (http://www.audubon.org/bird/iba/florida), or may be requested by mail for those with no internet access. The website will be updated frequently and will include GIS maps showing the locations of all nominated sites. Florida's Important Bird Areas will be selected by a committee of some of the state's leading ornithologists and conservation biologists in late 2000. It is anticipated that a book of Florida's IBAs will be published by early 2002. All contributors will be acknowledged.

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FLORIDA ORNITHOLOGICAL SOCIETY SPECIAL PUBLICATIONS

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INFORMATION FOR CONTRIBUTORS

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THE PRESENT AND FUTURE OF THE CAPE SABLE SEASIDE SPARROW

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Abstract.—Seaside Sparrows (*Ammodramus maritimus*) breeding in the Everglades region belong to a morphologically distinct subspecies (the Cape Sable Seaside Sparrow, *A. m. mirabilis*). This population is isolated from the other races of the Seaside Sparrow, the closest of which, the Scott's Seaside Sparrow (*A. m. peninsulae*), is found 300 km north. Other than appearance, the only significant difference between the Everglades subspecies and its relatives is in habitat use. Unlike other Seaside Sparrows, most of which live in salt marshes, the Cape Sable Seaside Sparrow now appears to be confined to freshwater sites.

The history of the Cape Sable Seaside Sparrow is fragmentary. Populations have frequently disappeared, and the same or other populations have been rediscovered in widely separated areas, often many years later. These long-range shifts in distribution, if real, appear to have been in response to the fluctuations that characterize the temporally unpredictable environment of the Everglades. Disturbances such as fire and hurricanes have caused shifts in population distributions, and also long-term modifications of sparrow habitats.

Since the research of Harold Werner, initiated in 1970, several studies have been conducted in an attempt to determine the number of sparrows remaining, and to gather information about their demography. Werner estimated that 2,000-3,000 birds remained in 1974-1975. In 1981 the population was again surveyed, and it was estimated that 3,300 male sparrows remained. In 1991 the survey was resumed. Although referred to as the "extensive" survey, it has not completely covered all potential habitats of the species, nor even the original 1981 census points.

Data collected from a limited number of birds indicate that the Cape Sable Seaside Sparrow has high reproductive potential: females can produce up to nine fledglings per year. Survival rates are high: on average, at least 60% of adults survive from year to year. Preliminary radiotelemetry studies indicate that juvenile sparrows can disperse long distances from their natal sites.

Based on the results of the extensive surveys, claims have been made that the subspecies is decreasing. These results do not fit a population model that incorporates high fecundity and survivorship, as well as extensive juvenile dispersal. This contradiction

may be clarified when valid survey data are available, and after more detailed demographic information has been gathered.

The main Cape Sable Seaside Sparrow population now appears to live in muhly (*Muhlenbergii filipes*) prairie east of Shark River Slough. Although the recovery plan states that muhly prairie is the "preferred" habitat of the subspecies, information about nesting habitats that the birds have used in the past suggests that muhly prairie is simply the habitat into which the sparrow has moved most recently. Management decisions to enhance the recovery of the Cape Sable subspecies are based on the results of the extensive surveys, and on the corollary assumption that muhly is the optimum habitat for the subspecies. For the most part, recovery efforts since 1975 have focused on controlling one environmental factor (water level) that affects sparrow distribution in this one habitat type. If the prediction of the government research, that the subspecies may become extinct within 20 years is true, then immediate intervention is warranted. Strategies such as relocation, captive-rearing, localized flood control, and predator control are recommended. Federal agencies responsible for the recovery of the sparrow have been unwilling to take such actions in its behalf.

The Seaside Sparrow (*Ammodramus maritimus*) occurs in small, localized populations along the Atlantic and Gulf coasts of the United States, from southern Maine to Texas (Werner and Woolfenden 1983, Post and Greenlaw 1994, Brinker 1997). Most breeding birds are confined to tidal marshes. Some have moved farther inland, to colonize freshwater marshes, as, for example, on the Hudson River in New York (Bull 1964), the St. Johns River in central Florida (Nicholson 1929), Taylor Slough of the Everglades region (Ogden 1972). Despite their use of freshwater habitats, the biology of the inland populations appears to differ little from that of birds living in tidal marshes, where the species is believed to have evolved (Beecher 1955).

Largely because of the alteration of coastal wetlands by humans, the Seaside Sparrow has disappeared from many parts of its range (Kale 1983, Greenlaw 1992). The highly distinct Dusky Seaside Sparrow has recently become extinct, and other subspecies distributed along the Gulf of Mexico are classified as threatened or of special concern by conservation agencies. The Cape Sable Seaside Sparrow is the most isolated of the five subspecies that occur in Florida. The distance between this race and the Scott's Seaside Sparrow (*A. m. peninsulae*) is 300 km.

Like the inland population of the Dusky Seaside Sparrow (*A. m. nigrescens*), the Cape Sable Seaside Sparrow occupies inland freshwater marshes. Decreases in the Cape Sable subspecies have been caused by wide-scale alterations of its habitat, including introductions of exotic plants, unnatural water regimes, and large-scale fires. The interactions of these factors make the conservation and management of the Cape Sable Seaside Sparrow difficult (Kushlan et al. 1982). The subspecies was listed as endangered in 1967. It has been the object of much recent research.

The purpose of this paper is to review the biology of the Cape Sable Seaside, and to discuss its management in light of what is known about

the species as a whole. Such a review is necessary at this time because recent publications and reports (Curnutt et al. 1998; Nott et al. 1998; Pimm 1995, 1996, 1997, 1998, 1999) do not consider previous research findings on the species as a whole, nor research on the Cape Sable Seaside Sparrow itself (Kushlan et al. 1982, Kushlan and Bass 1983, Werner 1975, Werner and Woolfenden 1983). This failure has led to misinterpretations of the subspecies' biology, and, consequently, to management failures.

ARE THE "EXTENSIVE" SURVEYS EXTENSIVE?

The Cape Sable subspecies is limited to the southern tip of Florida (Collier, Monroe and Dade Counties) in a roughly rectangular 700 km-sq area. Historical information shows that it was widespread and occupied several habitat types, although it took many years for ornithologists to discover new populations in the difficult terrain occupied by the sparrows. Once found, breeding groups ("colonies") were difficult to relocate. The disappearing breeding groups either had been extirpated or had moved to new areas. Population shifts may have been gradual, in response to successional changes, or abrupt, as a result of catastrophic habitat changes. Several widely-spaced populations have been found existing at the same time, and specific localities may hold sparrows for a few years, the birds then disappear, and the same or another group reappears elsewhere.

At the time of its discovery the Cape Sable Seaside Sparrow was thought to be restricted to brackish marshes in the Cape Sable area. It is possible that it also occupied other areas and habitats in extreme southern Florida. Since 1928 the subspecies has been documented as occurring regularly in three other areas of the Everglades region: Southern Big Cypress (Nicholson 1928), Ochopee (Anderson 1942), and Taylor Slough and the eastern side of Shark River Slough (Ogden 1972). Since 1992, surveys have been conducted over some parts of the subspecies' range, but details of the current status of the various populations have not yet been published.

Based on surveys conducted in 1974-1975, Werner (1978) attempted the first estimate of the entire population. Extrapolating to the area of known occurrence from densities that he found on measured plots on Taylor Slough, he estimated the total population to be 2,000 to 3,000 birds. This estimate assumed that the Taylor Slough birds made up 95% of the subspecies' numbers.

Kushlan and Bass (1983) conducted an extensive survey in 1981, using fixed-radius point-counts (Hutto et al. 1986). The original extensive survey (Kushlan and Bass 1983) did not cover all potential breeding areas although they assumed that the sparrows were uniformly distributed, and that the population density of each survey point accu-

rately reflected that which prevailed in 1 km^2. They thus assumed that each male represented a group of 16 pairs. They estimated the total population to be 6,600 birds. They speculated that the estimate represented a high point in a fluctuating population cycle, which was related primarily to the occurrence of fires.

In 1992, after a 10-year hiatus, the surveys were resumed in the same areas as the 1981 surveys (Curnutt et al. 1998), but coverage has been incomplete every year (mean percentage of 1981 points covered during 1992-1998 = 63%, range 22-93; Table 1). The historical range of the subspecies has not yet been completely surveyed. It is frequently stated that the surveyors periodically check other potential breeding areas outside the traditional survey area but no documentation of such spot checks has been published. Given the history of the sparrow's unexpected appearances in far-flung areas of the Everglades, it is advisable to conduct surveys over a wider area, because it cannot be safely assumed that the subspecies is confined to marl prairie, and that it does not disperse from unsuitable habitats.

The logistical difficulty of the Everglades environment has been cited as the reason the surveys have been incomplete. The survey is certainly a difficult endeavor, but perhaps it should take priority over less critical data-gathering, most of which, other than the results of radio-tracking, has produced little new information about the subspecies. Determination of the actual population size and distribution of the Cape Sable Seaside Sparrow is the most critical need at this time.

ARE THE POPULATION ESTIMATES RELIABLE?

It is difficult to provide a definitive estimate of total population size because the surveys did not cover all potential breeding habitat. How-

Table 1. Number of male Cape Sable Seaside Sparrows recorded in 1981 and succeeding years on the same plots. Sample plots that were invaded by trees (n = 30) were excluded for all years. Data from Kushlan and Bass (1983) and Pimm (1995, 1996, 1997, 1998).

Year	No. of points	Percentage of 1981 points	No. of males
1981	813	100	387
1992	757	93	368
1993	618	76	189
1994	181	22	survey incomplete
1995	505	62	159
1996	497	61	no data available
1997	486	60	225
1998	553	68	160

ever, annual reports submitted to Everglades National Park provide a rough index of total population numbers. These population estimates, based on extrapolations from the point counts (Table 1), show wide fluctuations between years within the different areas. The overall male population size was said to have remained stable between 1981 and 1992. Between 1992 and 1993, the population estimate fell by 50%. In 1993, surveyors counted 207 males (extrapolated to 3,312; Table 2) a reduction of 50% from the previous year. Many areas were not surveyed in 1993, however (Table 1; Curnutt and Pimm 1993). During 1994-1995, the overall population estimate remained about the same: 2,416-2,720 males. Between 1996 and 1997, the population increased, and then decreased the next year. By 1998, the estimate had fallen to 3,056 males, at about which level it has remained through 1999 (Pimm 1999).

Most of the population fluctuations have been due to variation in the size of the large group of birds north of the Ingraham Highway (Population "B"), which decreased by 11% (1995-1996), increased by 50% (1996-1997), and then decreased by 36%. The wide fluctuations in the estimated size of population "B" were likely caused by either sampling error or movements of males.

Although crude estimates of population size may have heuristic value on a year-to-year basis, it is not possible to make conclusive comparisons of population numbers between years, based on inferential statistics. This is because the point counts upon which the estimates are based are not independent of each other, in either space or time. Comparisons between years based on the samples are examples of "pseudoreplication" (Hurlbert 1984). The methodology used to estimate total population size is based on invalid assumptions, and therefore the results cannot be used to model population dynamics for the following reasons.

Table 2. Population estimates of male Cape Sable Seaside Sparrows in the Everglades region, 1981-1998 for each geographical area. Estimate obtained by multiplying number of males seen by factor of 16. Based on data provided by the U.S. Army Corps of Engineers (1998). Data for 1999 and 2000 not available.

Area	1981	1992	1993	1994	1995	1996	1997	1998
A	2,688	2,608	432	80 + *	240	272	272	192
B	2,352	3,184	2,464	2,224	2,128	1,888	2,832	1,808
C	432	3	0	**	0	48	48	80
D	400	7	96	**	0	80	48	48
E	672	37	320	112	352	208	832	912
F	112	2	0	**	0	16	16	16
Total	6,656	6,576	3,312	2,416 + *	2,720	2,512	4,048	3,056

*Survey incomplete.
**No survey.

Assumption 1. All males are recorded. The sampling procedure does not account for seasonal or diurnal variation in males' behavior. For example, male Seaside Sparrows may spend up to 32% of their time singing before the arrival of a female on territory. When young are in the nest, singing time decreases to 4% of the daylight period (Post 1974). The Cape Sable Seaside Sparrow has an extended breeding period (February-August; Werner and Woolfenden 1983). Most surveys have been conducted from late April to early June. This leaves unsampled two five-to-six week periods at the beginning and end of the breeding period. Until the summer of 1999 each plot was visited only once per year. It is possible that any bird remaining on its activity space during a flood that occurs early in the breeding season will wait until waters recede, and then nest, or move to higher ground, or build its nest higher (Tomkins 1941). Seaside Sparrow nests in tidal areas are frequently flooded, often several times in a season. Pairs whose nests are flooded immediately resume retesting (Greenlaw 1983, 1992).

Assumption 2. The surveys assume that males are distributed randomly, and therefore the probability of encountering a bird is the same at each of the census points. However, previous studies have demonstrated that territorial male Seaside Sparrows are often clustered. Large areas of suitable habitat are unoccupied, while in nearby areas sparrows occur at high population densities (Post 1974). Extrapolation from point counts underestimates population sizes in areas where sparrows are clumped (Curnutt et al. 1998).

Assumption 3. Sparrow activity spaces do not overlap. When feeding, Seaside Sparrows range widely outside their territories and may make foraging flights of over 1 km. This results in a pattern of overlapping activity spaces, which has been reported for Seaside Sparrows occupying tidal (Tomkins 1941) and non-tidal areas (Sykes 1980).

Assumption 4. Each male is mated. But, the proportion of unmated male Seaside Sparrows varies widely between breeding groups (23-60%; Greenlaw and Post 1985). At Taylor Slough in 1974, 12% of males remained unmated through the breeding season; 11% in 1975 (Werner and Woolfenden 1983). The variation in incidence of unmated males between populations appears to be related to habitat suitability (Greenlaw and Post 1985).

Assumption 5. Only areas that are surveyed have Seaside Sparrow breeding populations. The history of the intermittent disappearance and rediscovery of Cape Sable Seaside Sparrows in different areas of southern Florida (Kushlan and Bass 1983, Werner and Woolfenden 1983) argues against the validity of this assumption, however. The subspecies also displays an opportunistic response to the geographical-habitat array (Curnutt 1996), and may abandon and later recolonize

specific areas, depending on water levels (Werner 1975, Werner and Woolfenden 1983, Lockwood et al. 1996). This assumption can be tested only by increasing the area of coverage of the surveys.

A final problem comes from the manner in which the population estimates are presented (Anonymous 1997). Each year an estimate of total population size is provided, without any indication of the precision of the results. Using just the count of birds detected per unit effort as an index of abundance is neither scientifically sound nor reliable (Burnham 1981). Readers cannot make independent evaluations of the data. We would have a better understanding of the estimates if we were provided with confidence intervals. Further, the complete results of the surveys should be published and the assumptions and methodologies specified. Annual reports state that the results are not final (Pimm 1998), but the results are used as the basis for management decisions and government position papers (Anonymous 1997, 1999).

IMPROVING THE SURVEYS

The reliability of estimates made from circular plots depends on how potential sources of variation (e.g., among years, within season, habitat associations, and space use) are treated. When the survey was reinitiated in 1992, the researchers continued to use the preliminary sampling procedures of Kushlan and Bass (1983). It would have been advisable, instead, to design statistically meaningful sampling techniques such as, 1) random placement of point counts among years within regions; 2) within year replications; 3) distance sampling (Buckland et al. 1993); 4) calibration of detectability, according to observer and habitat (Bennetts et al. 1999). Curnutt et al. (1998) tested the reliability of the census technique by comparing the number of birds known to be present on measured census plots with those estimated to be present from point counts of the same areas. Their results indicated that the point counts underestimate actual numbers present by 36%.

The American Ornithologists' Union Cape Sable Seaside Sparrow panel (Walters et al. 1999) stated that because of its shortcomings, the current survey methodology is of limited utility in drawing inferences about population trends. The panel recommended that the census takers determine what proportion of males are actually singing at a given time, and use this information to correct the estimates. It was also recommended that the survey teams determine what proportion of males are actually mated. The panel also urged that the surveys be conducted over a larger area. Despite these recommendations, the surveyors have continued to cover a limited area of the subspecies' potential range, and the annual reports continue to provide uncorrected population estimates (Pimm 1999). As the survey methods were flawed in the past,

and continue to be flawed, they cannot be used to estimate accurately the population size, nor say anything definitive about the long-term population trends of the subspecies.

IS THE CAPE SABLE SEASIDE SPARROW A HABITAT SPECIALIST?

Seaside Sparrows occupy tidal marshes or nearby freshwater marshes (Kale 1983, Robbins 1983), but with a discontinuous, local distribution (Greenlaw 1983, 1992). The physiognomy of vegetation used by the species varies, and reflects opportunism in using available substrates (Greenlaw 1983). Requirements shared by most breeding populations are: first, elevated nest sites that provide protection from periodic tidal and storm flooding; second, nearby openings in vegetation, such as pannes, pools and creek edges, which allow birds to forage on open mud, and at the bases of rooted vegetation. Optimum habitats contain contiguous nesting and feeding sites; otherwise, birds commute between nest-centered territories and distant feeding areas (Woolfenden 1956).

The Cape Sable subspecies was first described as occupying brackish marshes ("salt grass", *Distichlis spicata*), and adjacent, presumably less saline marshes dominated by "switch grass" (*Spartina bakeri*) in the southwestern part of its range (Stimson 1968). The structure of this habitat is similar to that occupied by other subspecies (MacGillivray's, Scott's, and Dusky). After the hurricane of 1935, populations of sparrows were found nesting in similar habitat north of Cape Sable, along the western mangrove fringe, north to Ochopee.

Within the last two decades (Werner and Woolfenden 1983), Cape Sable Seaside Sparrows have been described as living in four distinct habitat types: 1) clumped *Spartina* prairies, 2) unclumped *Spartina* prairies, 3) sparse sawgrass prairies, 4) muhly prairies. In addition to these four habitat types, Kushlan and Bass (1983) describe a "mixed prairie habitat", which appears to correspond to sparse sawgrass prairie.

The majority of the surviving sparrows are now believed to nest in muhly prairie, mainly on marl in areas east of Shark River Slough. Before Ogden's (1972) rediscovery of Seaside Sparrows in the Taylor Slough area, and Werner's (1975) research, muhly was not reported as a nesting substrate, and Davis (1943) did not mention the species as a component of the marl prairies where the sparrow now occurs. It has been claimed that the muhly prairies now existing east of Shark River have been propagated by man-influenced reduction in water levels, coupled with the destruction of shallow organic soils by drought fires (Craighead 1974).

A Department of Interior position paper (Anonymous 1997) and the Cape Sable Seaside Sparrow recovery plan (Anonymous 1999)

state that the preferred habitat of the subspecies is mixed marl prairie. It is incorrect, however, to refer to a habitat as "preferred" on the basis of correlational patterns alone (Wiens 1989). Seaside Sparrow densities vary widely even within the same habitat, and reproductive potential is density-independent (Greenlaw and Post 1985).

It is possible that, because of degradation of the coastal and interior *Spartina* prairies that were once occupied by the sparrows, the subspecies is now breeding in the remaining vegetation that is most similar in structure to *Spartina* (Mayer 1998). It is possible that marl prairie may represent a marginal habitat for the subspecies. Reports that sparrows occupying this habitat in the last decade have low annual survival support this hypothesis (Pimm 1995). Similarly, the prairie marshes on the St. Johns River that were occupied by the Dusky Seaside Sparrow may have been marginal habitat. Unfortunately, although some information was gathered about the Dusky Seaside Sparrows in salt marshes on Merritt Island (Trost 1968, Sykes 1980), little was learned about the prairie-nesting sparrows (Baker 1973, 1978).

DOES THE CAPE SABLE HAVE LOWER SURVIVAL RATES THAN OTHER SEASIDE SPARROWS?

Using an estimation method presumably similar to that of Werner and Kushlan, and data on 18 birds followed over two years, Pimm (1995) estimated a minimum adult male survival rate of 50%. From 1994 to 1996, Pimm (1996) banded 122 sparrows. Only 29% of these were seen or caught by the end of the 1996 research season. He reported that adults that had nested in a given area had an annual survival rate of 100%, while those that did not nest had an annual survival of 38% (Pimm 1996).

In contrast to the low survival estimates provided by Pimm (1995, 1996), Werner (1975) estimated minimum annual survival as 88%. Based on additional information from the same study population, Kushlan et al. (1982) provide an annual adult survival estimate of 90%.

Over two years, Post et al. (1983) studied a color-marked population of Seaside Sparrows nesting at Gulf Hammock, Florida, and estimated annual adult male survival at 86%. Additional annual survival estimates for different cohorts from this population are above 80%. Some individuals have survived for nine years (Post and Greenlaw 1994). The 50% survival rate provided by Pimm is clearly anomalous.

THE CAPE SABLE SEASIDE HAS HIGH REPRODUCTIVE POTENTIAL

The measurement that is used to estimate reproductive potential, the number of young per female per year, is higher for this subspecies

than for other population of the Seaside Sparrow. Two published papers (Werner and Woolfenden 1983, Lockwood et al. 1997), and two unpublished reports include information on the nesting success of the Cape Sable Seaside Sparrow (Werner 1975, Fenn 1997). Based on an average of four data sets (Fenn et al. 1997), total nesting success (percentage of eggs that produce fledglings) was estimated at 64%, which is much higher than that reported for Seaside Sparrows at Gulf Hammock, Florida (3%; Post et al. 1983), and higher than that on Long Island, New York (35%; Post et al. 1983).

The mean clutch size of *mirabilis* is 3.5 (Post and Greenlaw 1994), compared with a clutch size of 3.1 in *peninsulae* (Gulf Hammock, Florida) and 3.1 for *macgillivraii* (southeastern Atlantic coast; Post and Greenlaw 1994). Female Seaside Sparrows may initiate as many as four clutches per season. The core period of the nesting cycle is 25 days: four days for deposition of eggs, 12 days for incubation (incubation may start with the laying of the penultimate egg), and nine days during which young are in the nest (Werner 1975, Post and Greenlaw 1994). Males may feed fledglings alone, and females may initiate a new clutch before the old one has fledged (Marshall and Reinert 1990, Werner and Woolfenden 1983). Nest construction usually requires 3-4 d. Therefore, it is possible that a new cycle can start within 30 d of the completion of the preceding clutch. This agrees with Werner (1975) and Marshall and Reinert (1990). If females are physiologically capable of producing four clutches per season, and if nest mortality rates are low, most pairs should be able to produce at least three broods within a 125-d period.

Length of breeding season in *mirabilis* may exceed 150 d (Werner and Woolfenden 1983). If the first nesting cycle requires 35-40 d, and each succeeding cycle requires 30-35 d, and assuming that reproductive success is 64% for each nesting attempt, it is possible for a successful female to produce nine fledglings per season.

IS FLOODING OR PREDATION THE MAIN CAUSE OF NEST LOSS?

Little is known about the causes of nest loss in the subspecies. Although the sampling schedule of the nest-searching program has not been published, efforts appear to have been concentrated in the study areas north of the Ingraham Highway (area "B") during April-June. In a few cases, Werner (1975), Lockwood et al. (1997) and Fenn et al. (1997) inferred causes of mortality to nest contents. At Taylor Slough, 4 of 55 eggs were depredated (7%), and 9 of 55 (16%) failed to hatch. Predation was confirmed during the nestling stage (seven young lost); Werner listed no other causes of mortality for nestlings. Lockwood et

al. (1997) reported that 2 of 36 eggs with the opportunity to hatch failed to hatch, 2 eggs were flooded, 3 young were flooded, and 1 nestling presumably starved. Overall, 78% of all losses of young and eggs were attributed to predation. Lockwood (1998) reported that predation accounted for 92% of all nest losses in 1998. No nests were lost to floods, and no other sources of mortality were listed.

Based on the assumption that higher water levels lead to lowered reproductive success, Nott et al. (1998) claimed a relationship between water levels and population decline. However, in 1997 birds breeding west of Shark River Slough (the most flooded area) had the highest nest success of any of the populations (75%, versus 66% for the other subpopulations; Pimm 1997).

In contrast to statements (Anonymous 1997) that nesting ceases during flooding, Dean and Morrison (1998) found that clutches were initiated during periods of high water (depth >10 cm). The water depth under some nests with eggs or young was 20 cm. They found evidence of successful nestings near the end of July and into August, during periods of high water. Dean also found a flightless young sparrow in early August, after a period of high water. Although they did not estimate the proportion of nests that were successful, their finding that at least some nests were successful refutes the hypothesis that all nesting ceases when water levels begin to rise (Anonymous 1997).

In 1996-97 Lockwood (1998) found peaks in the seasonal pattern of predation, which were correlated with rises in water level. No such peaks were found in the 1998 nesting season, which was attributed to lack of surface water (Lockwood 1998). The species of predators were not determined, although snakes were mentioned as possibilities. It was not explained how high water led to increased snake activity. It has been shown, however, that rodent movements in the Everglades are affected by fluctuations in water levels (Smith and Vrieze 1979). Nest survival of Seaside Sparrows in other areas of Florida is affected by rice rat (*Oryzomys palustris)* predation (Post 1981). Despite this information, and after nine years of research, no attempt has been made to determine the species or numbers of predators in the Cape Sable Seaside Sparrow nesting areas.

IS THE SPARROW SEDENTARY?

Our inability to track dispersal prevents us from understanding population dynamics at the landscape level (Faaborg et al. 1998). As yet we have little information on juvenile dispersal of the Seaside Sparrow. Recent radio telemetry studies demonstrate that at least some juveniles may disperse up to 7 km after the nesting season; movements appear to halt when individuals meet a habitat barrier such as

a hammock (Dean and Morrison 1998). The researchers also found a male that nested in one area, and then moved during the same breeding season to establish a new territory about 3 km away.

The Seaside Sparrow is believed to have evolved in estuarine areas (Beecher 1955, Werner and Woolfenden 1983). Individuals that occupy tidal areas respond to seasonal changes in water levels by moving relatively long distances. It seems reasonable to assume that Cape Sable Seaside Sparrows have retained sufficient behavioral flexibility to respond appropriately to short-term habitat changes, whether predictable ones such as water level changes, or unpredictable ones, such as those caused by hurricanes and fires. Based on their failure to find marked individuals farther than 1 km from their summer territories, Balent et al. (1998) concluded that the Cape Sable Seaside Sparrow was sedentary throughout the year. Their sampling methods were flawed, however, as they did not correct for the attenuation of bird numbers as distance from the capture point increased (Ostrand et al. 1998).

Sharp (*in* Kushlan et al. 1982) pointed out the importance of post-breeding emigration of juvenile Seaside Sparrows as a means of population maintenance in habitats that undergo periodic perturbations. The limited amount of data indicate that Seaside Sparrows nesting in non-tidal areas disperse relatively long distances. Six of 13 Dusky Seaside Sparrows nesting in brackish impoundments on Merritt Island, Florida, moved 1.2 km between years; one moved about 1.6 km within the same nesting season (Sykes 1980). In the non-breeding season, Sykes also found Dusky Seaside Sparrows 8 to 32 km outside their known breeding range; Sharp (*in* Kushlan et al. 1982) felt that such movements were in response to habitat degradation occurring in dried-out prairie. Similarly, Dusky Seaside Sparrows nesting on *Spartina* prairie were reported to move up to 1.6 km from their original banding site (Baker 1978).

Werner (1975) documented movements by juvenile Cape Sable Seaside Sparrows. In 1974, a male established a territory 400 m from the site where he was banded as a fledgling; a female was caught 940 m from its original banding point. Werner stated that post-breeding emigration of fledglings probably provided the principal mechanism of dispersal. Kushlan et al. (1982) cited instances of population densities increasing in unburned areas after a fire, suggesting that the sparrows reoccupied suitable habitat soon after being displaced.

WILL THE CAPE SABLE SEASIDE SPARROW BE EXTINCT IN 20 YEARS?

As recently as 1991, the surveyors reported that as many as 6,000 Cape Sable Seaside Sparrows remained. A population of this size is

large for this species in any part of its range. Other races of the Seaside Sparrow are found in small, widely-separated groups that are distributed along a narrow coastal fringe. It is possible that several subspecies found along the Gulf of Mexico (*A. m. sennetti, A. m. fisheri,* and *A. m. juncicola*), which are not listed as endangered, have less than 6,000 individuals (Kale 1983, McDonald 1988).

Conservation agencies and their consultants have stated that the Cape Sable subspecies will become extinct within 20 years if present trends continue (Anonymous 1997). This claim is based on a population viability analysis model developed by Pimm (1997). Population viability analysis models predict population changes, and estimate the probability of extinction based on projected environmental changes (Shaffer 1990). Accurate demographic data are still lacking for this subspecies, and predictions of population viability based on "estimates" of demographic features must be viewed with considerable skepticism (Caughley 1994). It is misleading to base population viability analysis models on abundance estimates with high confidence intervals (Ludwig 1999), which are the kinds of estimates that are provided by the extensive surveys.

If we accept the hypothesis that the Cape Sable Seaside sparrow will become extinct within 20 years if present trends continue, emergency management procedures should be implemented immediately. The only recent recovery strategy pursued by Everglades National Park has been to request other government agencies to manipulate water levels west of Shark Slough. The requests are based on the assumption that the subspecies will become extinct if the western population is extirpated (Anonymous 1997). Data have not been provided to support this assumption. Theoretical models should not be used as the basis for decisions that will have unknown effects on large areas of the Everglades, including habitats occupied or potentially occupied by other populations of the Cape Sable Seaside Sparrow.

LOCAL INTERVENTION IS NECESSARY

As was the case with the Dusky Seaside Sparrow, the bulk of the Cape Sable Seaside population is confined to federally-owned land. Despite this additional level of protection, the Dusky became extinct, and at least some populations of the Cape Sable continue to decrease. The passive management approach pursued by the responsible federal agencies allowed the decline of both subspecies. To protect the Dusky Seaside Sparrow, the U.S. Fish and Wildlife Service purchased 6,200 acres as a reserve for the St. Johns population; however, once they had bought the land, they failed to plug a drainage ditch that ran through the refuge. This ditch caused abnormal drying of the prairie marshes. The re-

maining breeding population was engulfed by wild fires (Walters 1992). Similarly, Everglades National Park has undertaken little habitat management for the Cape Sable Seaside, such as prescribed burning. The park has pursued a passive, wait-and-see approach to the sparrow's conservation.

Kushlan et al. (1982) assessed the status of the subspecies, and concluded that "the sparrow was probably never abundant but was, apparently, and remains, widespread in southern Florida." Unfortunately, although a preliminary survey protocol was established in 1981, for ten years Cape Sable Seaside Sparrow populations were not monitored. It is not known to what extent Everglades National Park has continued prescribed burning for improving nesting habitat, as recommended by Werner (1975), Taylor (1983), and Kushlan et al. (1982). The recovery plan outlined by Kushlan et al. (1982) listed 17 research goals, none of which appear to have been addressed until 1992.

In the first Cape Sable Seaside Sparrow recovery plan, Kushlan et al. (1982) proposed continued vigilance and some habitat management as a means of maintaining the status of the bird. Post (1983) reviewed the management plan, and concurred in this conclusion, but noted that, in light of its relatively high reproductive potential and high survival rate, the subspecies' supposed decline was paradoxical. It also was pointed out that though the management plan was thorough, it was not innovative. For example, it did not consider the potential of translocation or captive-rearing, although these approaches had been successfully developed during recovery efforts for the Dusky Seaside Sparrow (Post and Antonio 1981). The plan also did not mention field intervention techniques, such as use of predator-baffles to protect nests, which also had been developed as a method to improve the reproductive success of Dusky Seaside Sparrows (Post and Greenlaw 1989). Although predation is a main cause of nest mortality of Seaside Sparrows in Florida (Post 1981), no effort has been made to study the predators of the Cape Sable seaside, let alone to control their effects. If flooding is the cause of nest losses in a limited area, it is feasible to construct small dikes to exclude high water (Richard Bonner, U.S. Army Corps of Engineers, pers. comm.). Seaside Sparrows often occupy extremely small activity spaces (Post and Greenlaw 1994). It would be possible to provide flood protection for 16 breeding pairs by diking only 1 ha.

Despite the recommendations of recent researchers (Curnutt et al. 1998), the multi-species recovery plan (Anonymous 1999) continues to advocate the traditional passive management pursued in the last 20 years, the period in which the sparrow appears to have decreased most rapidly. If indeed the survival of the entire subspecies depends on preserving the few birds remaining west of Shark Slough (population "A";

Anonymous 1997), then these birds should become the focus of the recovery effort. Other than crude population estimates, little is known about the status of the "A" birds. In 1999 the surveyors found only 16 males in the "A" population. It should be a simple matter to protect these few birds from the effects of flooding or predation. The management techniques mentioned above would allow immediate intervention on behalf of this, the most threatened, subpopulation of sparrows. Such intervention would identify specific, attainable goals. The government position paper (Anonymous 1997) and recovery plan (Anonymous 1999) view water level as the single most important factor affecting the survival of the western population, and thus the entire subspecies. This view is leading to a simplistic approach to the recovery of the Cape Sable Seaside Sparrow.

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NOTES

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LEAST TERNS NEST ON THE DRY LAKEBED OF LAKE JACKSON, LEON COUNTY, FLORIDA

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Least Terns (*Sterna antillarum*) have nested in the interior north of the central peninsula of Florida in only two counties. Least Terns nested at phosphate mines from 1979-1981 in Hamilton County (Maehr 1982, Stevenson and Anderson 1994) and other breeding sites are in Leon County. A former breeding site in Jacksonville, Duval County, was on an abandoned surface mine near the St. Johns River where it is tidal and brackish (DeMort 1990); however, I do not consider this colony to be truly inland (*contra* Loftin 1973, Lohrer and Lohrer 1973).

In Leon County, Least Terns nested at the old Tallahassee Airport in 1975-1976 (TTRS archives; G. Menk, unpubl.) and have positively nested on roof-tops of a number of buildings in Tallahassee since 1983 (possibly as early as 1970) (Gore 1991, 1996; Tall Timbers Research Station archives; G. Menk, unpubl.). A maximum of two roof-top colonies were active each year until an additional colony became active several years ago (G. Menk, unpubl.). In 1999, at least 50 pairs of Least Terns nested on roof-tops in Tallahassee although the total was probably higher (G. Menk, W. W. Baker, and J. Cox, unpubl.).

Least Terns have also nested in Leon County on natural habitat, on the lakebed of Lake Jackson in 1955 and 1982 (Stevenson and Anderson 1994). On 1 July 1955, J. Fehon and H. M. Stevenson found a colony of about 20 birds and two nests, each with one egg (Stevenson 1995, Lohrer and Lohrer 1973, TTRS archives). On 2 July 1982 Stevenson found a colony of about 75 birds and six nests with eggs plus several recently fledged juveniles (one female barely able to fly, TTRS 3706; TTRS archives). The exact location of the colonies in 1955 and 1982 are unknown. I discovered one breeding colony of Least Terns at Lake Jackson on an island that emerged when the water began to drain in 1999.

Other than on Lake Jackson, Least Terns have not been documented to breed on natural substrates in the interior of Florida (McNair 2000). Lake Jackson is a sinkhole lake which has no surface outflow. This note documents Least Terns nesting at Lake Jackson in 1999. I also evaluate breeding information in 1955 and 1982 with respect to the unusual hydrology of this lake (e.g., see Wagner 1984) and within the context of nesting of Least Terns in the interior of Florida.

The colony site was near the southwest shore of Lake Jackson about 2 km north of the mouth of Megginnis Arm. The water level fell from 24.64 m (80.8 feet) to 24.59 m (80.62 feet) above sea level (staff gauge readings taken on U.S. Highway 27 by personnel of the U.S. Geological Survey) from 1-10 June. On 5 June the section of the lakebed where the nesting island formed was just above water (1-2 cm) and expanded to about 1 ha as water levels continued to drop. Much of the island was surrounded by emergent vegetation. Least Terns nested on the drier interior of the island which had fairly coarse light-colored sandy loam which supported less vegetation than the island edge. The dominant plant at the colony site was *Rynchospora* (spp.) which began to grow in early June. By early July, this sedge had a mean height of 15 cm (approximate range: 7.5-22 cm). The other common plant within the colony site was pickerel weed (*Pontederia cordata*) which were 20-25 cm tall by early July and some individuals had doubled in height by mid-July.

Least Terns began laying eggs on 9 June (three clutches with one egg each), when the colony site was approximately 5 cm above water and the surface was still moist. I visited the colony once and occasionally twice a week thereafter. Some clutches were placed next to flotsam (driftwood, glass bottles). The maximum number of active nests present occurred on 27 June when I found 19 clutches (5 with one egg, 14 with two eggs). The minimum number of clutches laid by Least Terns was between 23 and 30. The last active nest was observed on 22 July. Thirteen nests failed between 11-18 July. Only four new or replacement clutches were laid after June, when the sedge rapidly began to cover the colony site and pickerel weed invaded the site.

Least Terns were also exploring a 2 ha, broad, moist flat near Brill Point, 3 km away, and initially in early June the number of birds on this flat was greater than on the island. The terns scratched out several nest scrapes but abandoned this flat, possibly because the vegetation was higher and much denser than on the island and ground predators had greater access to the flat because it became attached to the mainland at Brill Point because of falling water levels.

I saw four downy chicks (1-2 days old) on the island on 11 July. One chick died between 11-18 July, but the other three plus one smaller chick previously overlooked, were still present on 27 July. This chick died but the three larger young successfully fledged by 1 August. No other juveniles were present at the colony site on 1 August. W. W. Baker and I watched adult Least Terns repeatedly feed the three recently fledged young at roosting areas at the perimeter of the island, for a maximum success rate of less than 10%.

Predation was likely the major cause of low nest success. I found six eggs with punched holes during 11-18 July. Most other eggs disappeared without a trace. Flocks of Fish Crows (*Corvus ossifragus*) depredated other species of nesting birds along the shore of Lake Jackson in 1999 (D. B. McNair and W. W. Baker, pers. obs.). Laughing Gulls (*Larus atricilla*) occurred in low numbers (≤ 6 birds) at Lake Jackson and were repelled by adult Least Terns (D. B. McNair, pers. obs.).

I censused the Least Tern breeding colony at Lake Jackson throughout the nesting season in 1999, unlike 1955 and 1982. The colony was larger in 1999 in early July (19 nests with eggs) than in either 1955 or 1982 (2-6 nests with eggs). The similar timing of nests with eggs in all three years and the absence of any chicks suggests that Least Terns probably also initiated egg-laying around early June in 1955 and 1982. Several recently fledged juveniles in early July 1982 also suggest that some pairs nested earlier (cf., Lohrer and Lohrer 1973). Regardless, the few young that have fledged from the anomalous breeding sites on the lakebed of Lake Jackson suggest that this sinkhole lake is a biological sink for breeding populations of Least Terns.

In 1999, the presence of families of Least Terns at Lake Jackson throughout June and into July suggest that other birds which nested on the island originated from roof-top colonies in Tallahassee. The maximum number of Least Terns at the colony was 130 on 27 June. The number of non-breeding birds was always at least twice that of breeding individuals. Whether Least Terns that nested at Lake Jackson in 1999 had failed earlier or were late breeders is unknown. Nonetheless, despite the apparent breeding success of many Least Terns at roof-top colonies in Tallahassee and low nest success at Lake Jackson in 1999, the presumed shift of some birds to Lake Jackson suggests that Least Terns prefer to nest and forage in one area (cf., Maehr 1982). Least Terns foraged at Lake Jackson since their arrival in Leon County in mid-April, especially at the south end of the lake, closest (5.3 km) to the nearest roof-top colonies in Tallahassee. Typically, 30-40 terns foraged at the lake at any given time (D. B. McNair, pers. obs.). As many as 20 Least Terns also regularly foraged at Lake Carr, part of the Lake Jackson watershed, but further (11.4 km) from the nearest roof-top colonies. Both distances in Leon County are further away than distances from foraging areas to roof-top colonies on the coast (Gore 1996). The exposure of potential nesting habitat at Lake Jackson apparently initiated a rapid colonization response from birds already familiar with the area.

In contrast to 1999, Least Terns did not nest elsewhere in Leon County in 1955 and, perhaps, not elsewhere in 1982. The distance to Lake Jackson from the coast of Wakulla County is about 55 km. Least Terns were unknown in Hamilton County, even further away (75 km) from the coast, when they colonized phosphate mines located near the Suwannee River (Maehr 1982). Maehr (1982) postulated that birds flew upriver from the Gulf of Mexico to arrive at the mines. Least Terns departing from Wakulla County also could have taken an overwater route (rivers and lakes; cf., Interior Least Tern *S. a. athalassos*, Thompson et al. 1997) to Lake Jackson. However Least Terns arrived, colonization of isolated breeding sites in the interior of northern Florida (including roof-tops of buildings in Leon County) where they are otherwise rare suggests that Least Terns can rapidly disperse and opportunistically colonize potential breeding sites if suitable habitat becomes available (cf., Lohrer and Lohrer 1973, Maehr 1982).

Least Terns did not nest at Lake Jackson in the year following either 1955 or 1982. A sinkhole temporarily drained a major portion of Lake Jackson in 1982 (Wagner 1984), but water returned by June 1983. In 1956 when the water level was even lower than in 1955, some Least Terns returned to the colony site on 25 May but did not nest (TTRS archives), probably because vegetation covered the lakebed on the island. The mean surface-water elevation of Lake Jackson in June 1999 (24.6 m [80.61 feet]), when only one island in Lake Jackson was exposed, was higher than in either June 1955 (24.2 m [79.28 feet]) or June 1982 (24 m [78.75 feet]). Under current conditions, this surface-water elevation is the maximum level under which the lake bottom can become exposed. In only six years since 1950 have surface-water elevations in June been lower than 24.7 m (81 feet): 1955-1958, 1982, and 1999 (U.S. Geological Survey data). My examination (D. B. McNair, unpubl.) of information on surface-water level fluctuations and estimates of the annual gain and loss of water at Lake Jackson (cf., Wagner 1984, Bartel et al. 1991, Brenner et al. 1992) suggest that the 1950s through the 1960s appear to have been dominated by climatic conditions (wet and dry periods; e.g., prolonged drought from 1954-1958), and from 1969 to the present by groundwater loss (leakage) and sinkhole activity. Regardless, the hydrology of Lake Jackson is poorly understood and cannot be used *a priori* to predict low water levels, and thus, when Least Terns may nest.

In summary, Least Terns nested at one colony on an unusual natural substrate (dry lakebed) at Lake Jackson, Leon County, Florida, when the water level dropped in 1999. The maximum number of active nests (19) occurred on 27 June. Breeding success was low (<10%), but three young fledged in late July. Breeding of Least Terns in 1999 and also in 1955 and 1982 was opportunistic and reflects the unpredictable nature of Lake Jackson as well as the well-documented colonization abilities of the species. Lake Jackson has been the only natural site in the interior of the United States where the nominate subspecies of the Least Tern *Sterna antillarum antillarum* has nested (see Patten and Erickson 1996, Johnson et al. 1998).

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SIMULTANEOUS USE OF A SNAG BY THREE BREEDING BIRDS IN CENTRAL FLORIDA

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Many records document simultaneous use of a tree or snag by multiple species of cavity-nesting birds. Most such nesting associations involve two species, one of which is usually a woodpecker (Hoyt 1948, Reller 1972, Venables and Collopy 1989, Ingold 1990). Fewer observations document nesting associations of three or more species. Gutzwiller and Anderson (1986) recorded simultaneous nesting by a pair each of American Kestrel (*Falco sparverius*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), and European Starling (*Sturnus vulgaris*) in a decayed limb of a living tree in Wyoming. Sprunt (1931) described simultaneous site use of two pairs of Northern Flicker (*Colaptes auratus*) and one pair each of Eastern Screech-Owl (*Otus asio*), Downy Woodpecker (*Picoides pubescens*), and Great Crested Flycatcher (*Myiarchus crinitus*) in a tree in South Carolina. I describe herein the habitat characteristics, behavioral interactions, and breeding phenology of a nesting association of Red-headed Woodpecker, Northern Flicker, and Great Crested Flycatcher in central Florida. My information is based on >7 hours of observation made from mid-May through June.

The nest snag was located in a sandhill at Wekiwa Springs State Park (WSSP), Orange County, that was dominated by a longleaf pine (*Pinus palustris*) canopy, turkey oak (*Quercus laevis*) understory, and wiregrass (*Aristida beyrichiana*) ground cover. The nest snag was a lightning-killed longleaf pine that was 19.3 m in height with a diameter at breast height (DBH) of 43.2 cm. No bark remained and 8 limbs were ≥1 m long. Nest cavity height, diameter of bole at cavity entrance, and cavity orientation were, respectively, 10.1 m, 36.1 cm, and 190° for Red-headed Woodpecker; 15.7 m, 24.6 cm, and 300° for Northern Flicker; and 14.5 m, 29.0 cm, and 285° for Great Crested Flycatcher. Snags (≥7.6 cm DBH) were quantified in five 0.04-hectare circles (James and Shugart 1970) in the vicinity of the nest snag and, for comparison, at 24 additional Red-headed Woodpecker nests in WSSP sandhills. The nesting association area was below average in snag (longleaf pine and *Quercus* spp.) relative dominance (7% vs 20%, SD = 16) and longleaf pine snag density (5/ha vs 27/ha, SD = 25) and basal area (0.83 m^2/ha vs 1.96 m^2/ha, SD = 1.83), and near average in *Quercus* spp. snag density (20/ha vs 22/ha, SD = 21) and basal area (0.37 m^2/ha vs 0.44 m^2/ha, SD = 0.48).

On 14 May 1997, a color-banded male Red-headed Woodpecker and its mate were feeding nestlings at their cavity and a Northern Flicker was in its cavity. While a Red-headed Woodpecker and female Northern Flicker were in their cavities at 1235 on 15 May, a Great Crested Flycatcher arrived to feed nestlings in its cavity. The Great Crested Flycatcher attacked the female Northern Flicker three times when the latter emerged from its cavity. At 1249 the male Northern Flicker arrived, copulated with its mate, chased away the Great Crested Flycatcher, and then entered its own cavity. At 1251 both Great Crested Flycatchers perched near their own cavity. From 1300-1423 the Red-headed Woodpeckers fed twice, the male Northern Flicker remained inside its cavity tapping or excavating, and a Great Crested Flycatcher attacked the male Northern Flicker while the latter was still in its own cavity. Observations ended at 1423 when the female Northern Flicker arrived and replaced the male at the cavity.

On 21 May, observations of the nesting area were made from 0731-1146 and 1221-1309. Only the Red-headed Woodpeckers fed young during these periods, making 45 vis-

its to the cavity. When perched on the snag and not feeding nestlings, 77% (17 of 22) of the Red-headed Woodpeckers' movements were to locations within 2 m of their nest cavity and 23% (5 of 22) were to the top of the snag. Incubation periods for the Northern Flickers were 1 h 3 min and 1 h 22 min for the female, and 49 min and >54 min for the male. The Great Crested Flycatchers did not visit the snag but remained in their territory and gave 19 *wheep* calls within 100 m of the snag. Both adult Great Crested Flycatchers perched once in a large sand live oak (*Quercus geminata*) 9 m from the snag.

Several agonistic behaviors were observed on 21 May, but only one involved interaction between members of the nesting association. This interaction occurred when a Red-headed Woodpecker attempted to alight at the top of the snag, which was occupied by the male Northern Flicker. The Northern Flicker gaped as it watched the Red-headed Woodpecker approach the snag. When within 2 m of the Northern Flicker, the Red-headed Woodpecker changed its course of flight and landed at its own nest. Agonistic behaviors by a Red-headed Woodpecker toward other species consisted of "churring" at a low-flying Cooper's Hawk (*Accipiter cooperii*) and Red-shouldered Hawk (*Buteo lineatus*) and twice attacking and chasing a Red-bellied Woodpecker (*Melanerpes carolinus*) from the vicinity of the snag. Agonistic behaviors by the male Northern Flicker consisted of displacing a Red-bellied Woodpecker from the top of the snag and, in an apparently agitated manner, landing at and looking into the Great Crested Flycatcher nest cavity. However, when a Red-headed Woodpecker, Northern Flicker, and Great Crested Flycatcher once perched together in the sand live oak near the nest snag, no obvious agonistic behaviors were detected.

A Red-headed Woodpecker removed a fecal sac from its cavity on 27 May, while the female Northern Flicker was in its cavity. On 19 June, one fledgling Red-headed Woodpecker was perched near the nest snag. No Northern Flickers were present at the snag, but a female Northern Flicker was incubating three eggs in a recently excavated cavity in a turkey oak snag 50 m from the pine snag. The pine nest snag fell on 8 or 9 July. The Red-headed Woodpecker and Great Crested Flycatcher nests contained egg fragments. The Northern Flicker nest was empty.

Several ecological and behavioral factors potentially contributed to the concentration of species at the snag. The low relative dominance of snags, particularly longleaf pine, in the nesting area indicated a local scarcity of suitable substrate for cavity-nesting birds. Concurrently, the main exhibitors of sociality in North American picids are terrestrial (*Colaptes*) and some melanerpine woodpeckers (Short 1979). However, Red-headed Woodpeckers and Northern Flickers differ greatly in foraging strategy. Red-headed Woodpeckers in north-central Florida flycatch during ca. 80% of foraging time during the breeding season (Venables and Collopy 1989). Conversely, Northern Flickers are considered the most terrestrial North American woodpecker with ants constituting approximately 50% of its diet (Beal 1911). Red-headed Woodpeckers and Northern Flickers have simultaneously used a nest tree in Illinois (Reller 1972). At WSSP, this behavior has been observed twice (this account; Parks Small, pers. comm.) during observations of 110 Red-headed Woodpecker nests over 5 breeding seasons.

Taylor and Kershner (1991) studied 46 Great Crested Flycatcher pairs breeding in boxes in central Florida and stated that the flycatchers vigorously defend their territories. All picid intrusions into Great Crested Flycatcher territories were repelled and one attack against a Northern Flicker was noted as being particularly severe. Gabrielson (1915) observed Great Crested Flycatchers chasing from their nest a Red-headed Woodpecker and Northern Flicker. Stauffer and Best (1982) reported that Red-headed Woodpecker and Great Crested Flycatcher nests in riparian habitats in Iowa are "notably similar" and suggest a potential for considerable nest-site competition.

The failure of the Great Crested Flycatcher and Northern Flicker nests may have resulted from egg and young depredation. Red-headed Woodpeckers depredate the nests of Northern Flickers (Bendire 1895, Burns 1900) and many passerines (Bendire 1895,

Beal 1911) and they have been documented exhibiting this behavior at WSSP (Belson and Small 1998). Northern Flickers also depredate passerine nestlings (Allert 1934).

The color-banded male Red-headed Woodpecker used the snag continuously as a nest and roost site since the 1996 breeding season and, therefore, was present at the snag at the beginning of the 1997 breeding season. The Great Crested Flycatchers were second and Northern Flickers third to occupy the snag. The Red-headed Woodpecker breeding attempt was successful, as proven by the presence of a fledgling. The Great Crested Flycatcher and Northern Flicker nesting attempts were apparently unsuccessful. Male Red-headed Woodpeckers are highly territorial and at WSSP occupy individual snags year-round for ≤ 3 years (M. S. Belson, unpubl. data). This behavior likely contributed to the Red-headed Woodpecker being the only successful breeder of this nesting association.

These observations were made during a study of use of habitat by Red-headed Woodpeckers at Wekiwa Springs State Park. I thank the Florida Ornithological Society, Gopher Tortoise Council, and Citizens for Wekiva Basin GEOpark for their financial support. The comments of Parks Small, Walter Taylor, and Doug McNair are appreciated.

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A FALLOUT OF TURKEY VULTURES OVER FLORIDA BAY WITH NOTES ON WATER-CROSSING BEHAVIOR

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Many raptor species undertake water crossings of various lengths during the course of seasonal migration. Certain falcons (Falconidae), which use powered flight, appear to be well-suited to this strategy and routinely traverse distances of 3000 km or more (Ali and Ripley 1978, Pratt 1987). Water-crossing distances of ≤ 25 km (e.g., the Straits of Gibraltar) are much more common for all species, and most migratory routes appear to track paths which minimize time spent over water. New World vultures (Cicconiidae) are on the opposite end of the spectrum of water-crossing behavior from the falcons: they are known to attempt migratory water crossings, but are much less likely to do so than other raptor species (Kerlinger 1985) presumably because of relatively inferior ability in powered flight. I describe and analyze an unusual over-water flight of Turkey Vultures (*Cathartes aura*) in southern Florida.

On 23 January 1990 at approximately 1000 EST, I observed a large group of Turkey Vultures approaching East Cape (25°06'51"N, 81°05'02"W), the southernmost point of mainland Florida, from slightly west of due south over Florida Bay. Winds were light from the southeast at 0700 (having shifted from nearly due east overnight), but had increased to a steady 15-22 km/hr from the southeast under clear skies when these vultures first came into view less than 1 km offshore. The birds were flapping continuously at heights of 0.5-30 m and appeared to be in some distress. Within one minute, the lead vulture landed on the derelict dock upon which the observers were standing (which extended some 10 m into the bay) and immediately lay down, drooping its head and wings around the piling in apparent exhaustion. Despite the proximity of the four observers (<4 m), the remaining 15 pilings were quickly occupied, whereupon vultures began to land on the beach to either side of the dock. None of the later arrivals showed the signs of extreme exhaustion exhibited by the first bird; they simply landed and did not move once settled.

Of 96 vultures observed, 36 came in very low (< 3-4 m) and landed on the dock and beach, 49 reached the shoreline with enough altitude to rise on thermals to approximately 50 m before heading inland, and 11 birds came to rest in the water at distances of 5 to 300 m from the beach. Of those that "ditched" into the bay, nine were ferried ashore in the observers' canoe, one drowned, and one (the bird closest to shore) swam with little apparent difficulty to the beach, eventually joining the other vultures above the high water line. Before their behavior was altered by the approach of the canoe, all of the birds were approximately half submerged, but paddling quite strongly toward the beach with their feet with their wings slightly spread on the water's surface. At the approach of the canoe, the first two birds attempted to escape and had to be extracted from the water manually. They were calm once aboard. The remaining seven, possibly because they could see one of the first two rescuees perched on the gunwale drying its wings, made a frantic effort to clamber into the boat, eventually succeeding when the gunwales were rolled to water level. Upon our return to shore, one bird flew the final 20 m to the beach while the remainder hopped out as the craft made landfall. All eventually joined the birds that had landed there previously. Fifty-five minutes after the first vulture landed on the dock, all had returned to the air and flown inland.

We were unable to view this unusual migratory movement in its entirety, therefore, explanations for it are necessarily partly speculative. Much of the uncertainty that

accompanies this speculation, however, can be mitigated by existing information on vulture migration tactics and the circumstances of the fallout.

It is possible that the vultures were attempting a south to north crossing of Florida Bay by island-hopping across the many small islands in the eastern bay (Fig. 1, Route A). This route was documented by Darrow (1983) in late November 1981, when he observed a group of 355 Turkey Vultures leaving the main keys at Lower Matecumbe on a heading that would take them across Florida Bay in the direction of Flamingo (Everglades National Park). This is unlikely to have occurred in the present case for a variety of reasons, the most compelling being that East Cape lies too far west (relative to most of Florida Bay's islands) to be a reasonable destination for island-hopping migrants which would very likely aim for much closer mainland points farther east (see below). Only one small, isolated mangrove island, Sandy Key, exists in western Florida Bay from which East Cape would be an attractive destination. This key is within reasonable flight distance (11 km), but much like East Cape, it lies so far west of the other small bay islands that it would probably not be included in a trans-bay route. The vultures' approach to East Cape from the south-southwest also belies the island-hopping explanation. Had the birds departed from any of the north bay islands (which were all more or less directly upwind from East Cape), they would have approached from straight downwind, or southeast.

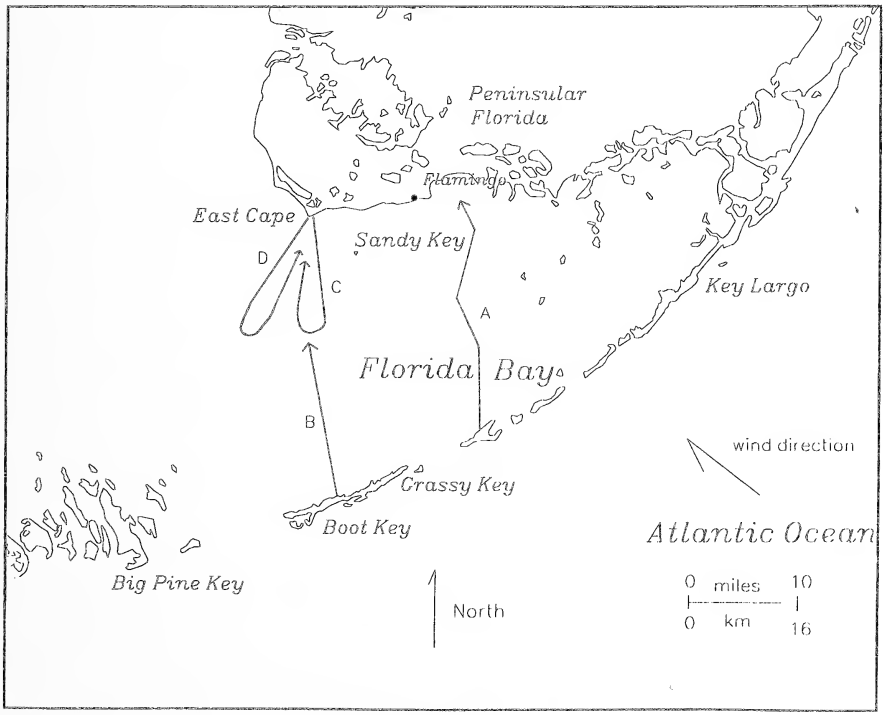

Figure 1. Possible routes used by Turkey Vultures attempting to cross Florida Bay either to or from East Cape. A) South to north island-hopping route (this path roughly delineates the western limit of small keys in Florida Bay, many of which are too small to register on the map). B) Direct route from the middle or lower keys to East Cape. C) Abortive attempt to reach Big Pine Key. D) Abortive attempt to reach Boot/Grassy Key.

Another possible explanation is that the vultures were attempting a non-stop, south to north flight from one of the middle or lower Florida Keys (Fig. 1, Route B). Although it has been suggested that Turkey Vultures are capable of migratory movements from south Florida to Cuba (Darrow 1983), between the larger islands of the Caribbean (Santana et al. 1986), and from the Yucatan Peninsula to the Gulf Coast of the United States (Kirk and Mossman 1998, Van Tyne 1945), a thorough review of this species' migration tactics clearly shows a very limited ability to make long, unaided flights over water. At Whitefish Point, Ontario, and Cape May, New Jersey, Kerlinger (1985) noted that roughly one-third of observed Turkey Vultures attempted to cross Lake Superior and Delaware Bay, but that only 10% were presumably successful. The remaining 90% returned to shore within a few minutes, some flapping hard only a few meters above the water. As neither the Whitefish Point nor the Cape May crossings much exceed 25 km, the 41+ km minimum distance between the lower Florida Keys and East Cape is probably prohibitive to Turkey Vultures in all but optimum conditions. It is also probable that vultures returning from the lower Keys would follow the main island chain northward where they could take advantage of the relatively short distances between islands and of the thermals that are produced by the land masses. Peregrines, Merlins (*Falco columbarius*), and American Kestrels (*F. sparverius*), all of which are much more likely to undertake long water crossings than Turkey Vultures, have been observed using this method to move northward through the Keys during spring migration (R. Moore, unpubl. data). More convincingly, of over 1000 migrating vultures observed from 10 Nov. through 14 Dec., nearly all followed a path either up (northeast) or down (southwest) the major keys (Darrow 1983). The one flock which deviated from these routes chose not to travel directly (over Florida Bay) to the mainland from its starting point at Grassy Key and instead moved 32 km up the main chain of islands to a location from which it could island-hop across Florida Bay (Route A in Fig. 1).

The third and most likely explanation is that these birds were observed during the return from an abortive attempt to cross from East Cape directly to the lower Florida Keys. The mid-December date of this incident makes southerly movement likely, although migratory irregularities (e.g., reverse migrations, etc.) are known to occur at many peninsular dead ends, and specifically at southernmost Florida (Darrow 1983). More importantly, other observations show that Turkey Vultures which encounter water barriers of more than 20 km sometimes attempt crossings but usually do not complete them. East Cape, like Cape May and Whitefish Point, is in a perfect position to lure birds into a crossing attempt. Vultures that have migrated down the west coast of Florida are ultimately funneled to the point of East Cape from which the Keys are easily visible (from a flight altitude) approximately 40 to 50 km away. Birds bound for these islands must choose between negotiating this distance at least partially over water and traveling eastward 3 to 4 times that distance across southern Florida and down the upper Keys. I suggest that the observed vultures, in an attempt to cross Florida Bay, departed East Cape either to the southeast toward Boot Key or Grassy Key and were blown slightly to the west upon their return (Fig. 1, Route C), or to the southwest towards Big Pine Key, a path they retraced on the return trip (Fig. 1, Route D).

Turkey Vulture behavior associated with crossing substantial bodies of water has rarely been recorded, therefore, it is unknown how wind speed and direction may have affected these birds' decision to cross. Flying directly or obliquely into a 15-22 km/hr wind may intuitively seem unwise for a long water crossing, yet it has been consistently noted that opposing winds are favored by some raptor species during autumn migration and at fall water crossings (Rusling 1936). Turkey Vultures at the tip of the Delmarva Peninsula will readily cross the 18 km-wide mouth of Chesapeake Bay on southeast winds (R. Moore, unpubl. data, Rusling 1936). The structures of the Chesapeake Bay Bridge and Tunnel system, however, offer rest areas of which these birds often make use. Kerlinger (1985) suggests that some raptor species do not cross water barriers with

following winds because returning to the point of origin is more difficult should it be necessary to abandon the attempt.

Mote (1969) reported a flock of 56 vultures that attempted to land on the superstructure of a fogbound motor vessel in Florida Bay, approximately 8 miles from East Cape (position deduced from description of route). Several of these exhausted birds drowned, but all mortality was apparently associated with failed attempts to land on the moving boat. Unfortunately, observers were unable to note the direction from which these birds arrived. There are no published reports of raptors "ditching" after failing to negotiate a water barrier. Although the literature is replete with accounts of dead raptors collected on the beaches of the world (Lambert 1983, Zu-Aretz and Leshem 1985), a review of water-crossing literature (Kerlinger 1989) makes no mention of reports of live birds that went into the water while trying to make landfall. Conventional wisdom maintains that beach recoveries represent individuals that exhaust themselves after becoming lost or misdirected over water during inclement weather (e.g., poor visibility, strong unfavorable winds), but this fallout of Turkey Vultures indicates that some species incur mortality as a result of poor judgment during fair weather crossings.

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NESTING OF ALLIGATORS AT THE ARTHUR R. MARSHALL LOXAHATCHEE NATIONAL WILDLIFE REFUGE

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The American alligator (*Alligator mississippiensis*) is a keystone species within the Everglades landscape. It shapes the landscape by constructing nests and maintaining alligator holes (Craighead 1968), and it is influenced by the hydrologic conditions within the landscape. The location and height above water that an alligator builds its nest depends on water levels immediately prior to and during nesting (Kushlan and Jacobsen 1990). Hatching success also can be influenced by water levels, for example, a rapid rise in water level during the nesting period can flood the egg cavity, leading to embryonic mortality (Joanen and McNease 1980).

Alligators, because of their linkage to hydrological conditions, have been selected as an indicator species for efforts to restore appropriate hydrology to the Everglades. Currently, efforts are underway to construct population and individually based models for alligators as part of the USGS Across Trophic Level Spatial Simulation (ATLSS) effort. This program seeks to build models for evaluation of possible effects of alternative water management plans on higher trophic levels in the greater Everglades region. It is necessary for these efforts to have information on reproductive characteristics (nesting habitat, clutch size, egg viability, nesting success, probability of flooding, etc.) of alligators across different habitats throughout south Florida. Published data on nesting and clutch characteristics can be found for numerous locations throughout Florida, including Lake Okeechobee (Woodward et al. 1993, Masson 1995), Water Conservation Areas 2 & 3 (Masson 1995), and Everglades National Park (Kushlan and Jacobsen 1990). No published data are available for alligator nesting in Water Conservation Area 1, which is part of the Arthur R. Marshall Loxahatchee National Wildlife Refuge (hereinafter Loxahatchee). This paper reports the results of a pilot study on nesting characteristics of alligators in Loxahatchee during 1999.

Loxahatchee is a 57,234 ha remnant of northern Everglades wetland. The interior of the refuge is completely surrounded by canals and levees, and hydrologic conditions are determined by local rainfall and water management. Water levels are regulated by the Army Corps of Engineers with water control structures in the north and south to match a prescribed schedule designed to keep the water between 4.27 and 5.18 m National Vertical Geodetic Datum (NVGD) depending on season. Unlike many areas of the Everglades, where there is little substrate overlaying the bedrock, Loxahatchee has a relatively deep peat base ranging from 1.25 m to over 4.5 m in depth (Stephens and Jones 1951, Stephens 1984). The peat surface topography influences the distribution of vegetation communities (Pope 1991) which include a mosaic of sawgrass (*Cladium jamaicense*) marsh, wet prairie, slough, and tree islands. This mosaic of habitats, combined with the high productivity associated with the deep peat soils results in a marsh system that contains high densities of potential alligator food items such as invertebrates, small and large fish, amphibians, and turtles. In addition, there are numerous habitat options for alligators, ranging from areas with tree islands that provide high ground for nesting to sloughs and alligator holes that provide refugia during droughts.

In addition to the interior marsh the refuge has a series of impoundments that have been or are managed for wildlife, primarily wading birds and shore birds. These impoundments are separated from each other by levees and contain various vegetation communities, including sawgrass, cattail (*Typha domingensis*), willow (*Salix caroliniana*), and pickerelweed (*Pontederia cordata*). Water levels in the impoundments are managed by refuge personnel. Alligators of all sizes are regularly observed in the interior and the impoundments.

We located alligator nests by searching likely areas by airboat (interior), truck (impoundments) and on foot (both) on six days between the end of June and the end of July 1999. We spent approximately 20 hours searching for nests primarily in areas along existing airboat trails, in areas where pods of young had been observed, and around alligator holes identified during other field work.

After locating a nest, we took a geographic coordinate using a geographical positioning system (GPS), and looked for an attendant alligator. If a female alligator was present, we attempted to capture it using a self-locking wire snare attached to a PVC pipe; if not, we approached the nest cautiously. We recorded habitat (tree island, sawgrass, levee, impoundment), nesting material, nest height (distance from the top of the nest to the ground surface to the nearest 0.5 cm), nest length and width (nearest 5 cm), distance to water, and amount of standing water at the nest (nearest 1 cm) for each nest. We opened nests, carefully removed all eggs, and placed the eggs in a plastic container, making sure to maintain the original egg orientation. We recorded clutch depth (distance to the nearest 0.5 cm from the top of the nest to the first egg), distance to the bottom of the clutch, and the presence of other eggs (primarily turtle); we counted eggs and measured the length and width of each to the nearest 0.01 cm using vernier calipers. We measured egg mass to the nearest 0.5 g using a 100 g pesola spring scale, and examined eggs for banding to determine if they had been fertilized. After returning all eggs to the nest and reburying them, we revisited all nests in September to determine if the eggs had hatched.

We coded each alligator nest as: (1) female aggressively defended nest, (2) female was present and visible but did not actively defend the nest, (3) female known to be present (bubbles, movement in the water) but was not visible (submerged), or (4) no sign of female at the nest. We measured mass, snout vent length, total length, and tail girth, determined the sex by probing the cloaca, and marked each captured animal by clipping scutes and by placing a web tag in the right rear foot. We released animals after collecting nest and egg data.

Of the 21 nests that we found, 14 were located in the interior of the refuge and 7 within the impoundments and headquarters area. Nests in the interior were located on small tree islands (n = 10; these often were wedged between tree trunks), on floating peat mat (n = 1), and in sawgrass (n = 3). Nests in the impoundments were found primarily along the levees, although one nest was located in the interior of an impoundment.

Nest height ranged from 30 to 83 cm (x = 61.3 cm ± 19.1). The bottom of the clutch, measured on the date the nests were located, averaged 27.8 ± 17.9 cm below the ground surface (range 4-53 cm) and 37.0 ± 19.3 cm above the water surface (range 16.5-78.0 cm). Nest length ranged from 90 to 350 cm (x = 166.9 ± 56.2 cm), and nest width ranged from 85 to 270 cm (x = 144.4 ± 47.9 cm). Nests were composed of nearby vegetation: leaf litter, sawgrass, and ferns on tree islands, and impoundment nests were made of grass from the levees and contained more dirt than did those in the interior.

Five alligator nests had eggs of other species, including American anole (*Anolis carolinensis*) and turtle (*Pseudemys nelsoni* and/or *Apalone ferox*) eggs. One nest in the interior had ants (*Cremastogaster* sp.) when it was opened, and we observed fire ants (*Solenopsis invicta*) at two levee nests during hatching. All nests produced at least 1 hatchling, but ants caused mortality in some nests.

We counted and measured eggs in 15 of the 21 nests. Three false nests (two in the interior and one in the impoundments) contained no eggs. Clutch size (CS) averaged 31 ± 9 eggs (range = 17-43) and clutch mass (CM) averaged 2287 g ± 542 (range = 1414-

3142 g). Egg mass, length, and width averaged 74.5 ± 13.1 g (range 33-128 g), 7.2 ± 6.0 (range 5.0-10.0), and 4.2 ± 0.3 (range 3.3-4.8) respectively. Clutch fertilization rate, as determined by banding of all of the eggs in eight nests and 98% of all eggs, ranged from 91 to 100%. There was a significant linear relationship between clutch size and clutch mass (CM = 49.2[CS] + 774.7; $P = 0.0007$; $r^2 = 0.60$) and between female size (SVL) and clutch size (CS = SVL[1.02] - 75; $P = 0.001$; $r^2 = 0.89$). We did not find a significant relationship between female size and clutch mass.

Mean clutch size in Loxahatchee was similar to values reported for other areas in south Florida (x = 24.2, Morea unpubl. data for Everglades National Park; x = 35.6 in WCA 2 and WCA 3, Masson 1995). In this study, clutch size showed a significant linear relationship to female size, but clutch mass did not, although sample size is small ($n = 7$). Relationships between female size, clutch size, and clutch mass in other studies are variable. Deitz and Hines (1980) saw no significant relationship between clutch size and female size in north central Florida ($n = 14$), but both mean egg weight and clutch mass increased with female size ($n = 7$). Joanen (1969) also found no significant correlation between clutch size and female size. Hall (1991) found a positive relationship between clutch mass and female size ($n = 11$) from various sites in north-central Florida; and Wilkinson (1984) found a positive relationship between average clutch size, clutch volume, and female size.

Egg fertilization rate can influence the potential reproductive output of a species and may vary with location. Low egg fertility can be an indicator of poor habitat conditions (e.g., low water), low population density, or an unknown environmental stress. Based on banding, 98% of the eggs in this study appeared to be fertile, which is relatively high. Deitz and Hines (1980) reported 0-77% unbanded eggs with an average of 10.9% ($n = 29$). Kushlan and Jacobsen 1990 reported 4.7% unbanded eggs for nests in Everglades National Park; and Percival et al. (unpubl. data) reported banding rates of 70-89% (unbanded—30-11%) for alligators in north central Florida.

Approaching a nest resulted in four outcomes: (1) a female aggressively defended nest ($n = 8$); (2) a female was present and visible but did not actively defend the nest ($n = 6$); or (3) a female known to be present (bubbles, movement in the water) but was not visible ($n = 3$); or (4) no sign of female at the nest ($n = 4$). Six females ranging in size from 1.96-2.27 m TL were captured at nests. The 38% of females that vigorously defended their nests against humans in this study is higher than values reported by Joanen (1969) in Louisiana (9.2%), Metzen (1977) in Okefenokee (18.7%), Deitz and Hines (1980) in Paynes Prairie (14.9%) or Kushlan and Kushlan (1979) in Everglades National Park (22%). This higher rate of defense in our study may be related to the fact that alligators at Loxahatchee either rarely encounter people (interior) or have non-threatening encounters (impoundments), as suggested by Kushlan and Kushlan (1980).

None of the nests in this study was depredated. The low rate of loss to predators may be a result of the combination of habitat, nest defense, and low numbers of predators. Racoons (*Procyon lotor*) and otters (*Lutra canadensis*) are present both in the interior and in the impoundments, but are not abundant. Additionally, no nests were flooded. The water levels in Loxahatchee are managed based on a regulation schedule that determines maximum and minimum water levels at different times during the year. The schedule dictates that the water levels during the June through August period stay between 4.80 and 5.12 m NVGD. Generally water levels fluctuate less than 0.3 m (1 ft) during this period. Water levels in 1999 fluctuated 0.84 m (2.75 ft) and were lowest in the first part of June, but rose rapidly throughout June due to heavy rains. The highest nesting season water levels occurred during the last week in June and the first week of July corresponding to the major period when eggs were laid. Nest cavities were generally high (averaging 28 cm above ground and 37 cm above standing water) probably as a result of the relatively high water levels during nesting. Kushlan and Jacobsen (1990) showed that the height above the marsh floor that eggs were placed was correlated with water level at the time of nesting.

The number of nests located in a fairly short period of time and the number of additional nests and pods of young located outside of this study indicate that nesting effort is fairly high in Loxahatchee. Our data also indicate that egg fertilization rate was high and vulnerability to predation and flooding was low in 1999. Observations of pods of young and juvenile animals suggest that this pattern of high reproductive output may occur frequently, but additional information on distribution of nests, impacts of water management, and temporal variation in clutch characteristics (size, egg mass, and egg fertility) will be needed to evaluate the success of Everglades restoration.

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FIELD OBSERVATIONS

Winter Report: December 1999-February 2000. The observations listed here are reports of significant birds or numbers of birds reported to the Field Observations Committee (FOC). Submissions to the Committee should be in the following format: species, number of individuals, age and sex of the bird(s), color morph if applicable, location (including county), date, observer(s), and significance. Reporting seasons are winter (December-February), spring (March-May), summer (June-July), and fall (August-November). Submit reports to regional compilers within two weeks after the close of each season, or to the state compiler within one month. Reports sent via email are greatly preferred over those sent via regular mail. Addresses of the FOC members are found at the end of this report.

Sight-only observations are considered "reports" while only those supported by verifiable evidence (photographs, video or audio tapes, or specimens) are called "records." Species for which documentation is required by the FOS Records Committee (FOSRC) are marked with an asterisk. A county designation (in italics) accompanies the first-time listing of each site in this report. Abbreviations used are: CBC = Christmas Bird Count, CP = county park, ENP = Everglades NP, EOS = end of season, FWBSTF = Fort Walton Beach STF (*Okaloosa*), BCC = farm fields near Black Creek Canal and SW 162nd Avenue (*Miami-Dade*), HISRA = Honeymoon Island SRA (*Pinellas*), HPM = *Hamilton* phosphate mines, LARA = Lake Apopka Restoration Area (former Zellwood muck farms; *Orange* unless specified), MCA = Marsh Conservation Area, MINWR = Merritt Island NWR (*Brevard*), NWR = national wildlife refuge, PPM = *Polk* phosphate mines, PPSP = Paynes Prairie State Preserve (*Alachua*), SMNWR = St. Marks NWR (*Wakulla*), SP = state park, SRA = state recreation area, STF = sewage treatment facility, and N, S, E, W etc., for compass directions. Bold-faced species denote birds newly reported or verified in Florida.

Summary of the Winter Season

Overall, this winter was relatively mild, with only a few, brief cold fronts that reached central Florida. Mild weather appeared to be at least partly responsible for the seemingly large number of individuals that chose to winter in the state, rather than migrate farther south. Rex Rowan characterized the season at Gainesville as "easily the most amazing winter season in recent memory" and Gail Menk echoed this sentiment in the Tallahassee region. Receding water levels at Paynes Prairie and Newnans Lake aided the numbers of rarities present at Gainesville. Similarly, declining water levels attracted large numbers of wading birds and shorebirds to Lake Hollingsworth in Polk County and Lake Jackson in Leon County.

At Lake Apopka Restoration Area, unflooded, weedy fields attracted an incredible diversity of rodent-eating raptors. Most surprising among these hundreds of buteos and harriers were three Rough-legged Hawks, which will represent the first verifiable Florida record pending FOSRC acceptance. The Restoration Area also attracted a great diversity of flycatchers, including 38 Western Kingbirds, only the second verifiable Cassin's Kingbird in Florida, and 5 Ash-throated Flycatchers. In 26 surveys during the winter, Harry Robinson tallied 163 species during the winter. The second Zellwood/Mount Dora CBC again exceeded 150 species (reaching 154), even without flooded fields at the Restoration Area.

In addition to the Rough-legged Hawks and Cassin's Kingbird at Lake Apopka, FOSRC rarities reported this winter were the California Gull and Snowy Owl in *Franklin*, the Calliope Hummingbird at Pensacola, the Bewick's Wren at Lake Apopka, and the Townsend's Warbler at Merritt Island. Other rarities were 3 Pacific Loons in the

Panhandle, the Ross's Goose that has resided at Crystal River since at least February 1999, a Hudsonian Godwit in Hillsborough Bay, a Ruff that wintered at Gainesville, Black-headed Gulls at Gainesville and Orlando, 2 Groove-billed Anis in the Peninsula, 8 Vermilion Flycatchers and 9 Ash-throated Flycatchers statewide, a Bell's Vireo at Lake Apopka, 19 Le Conte's Sparrows statewide, and 21 Bronzed Cowbirds at Lakeland. Large numbers of Northern Gannets were widely reported from shore along both coasts, and an amazing estimate of 500 Black-bellied Whistling-Ducks was made at Venice. Lastly, Lake Weir in Marion County attracted record-setting numbers of some aquatic species this winter; similar numbers were reported last winter, but these were not published in the FOC report.

This winter report will be the final FOC report that uses bird observations "plucked" from internet lists. The lack of documentation that characterizes nearly every such observation renders many of them unacceptable for inclusion in this report. Additionally, the volume of internet reports threatens to overwhelm seasonal bird reports published in *Florida Field Naturalist* and *North American Birds*. Bruce Anderson compiled all these observations for the Winter *NAB* report and had to sort through over **350 pages** of material.

Species Accounts

Red-throated Loon: 1 at Destin (*Okaloosa*) 20 Dec (B. Bremser); 8 at Alligator Point (*Franklin*) 9 Jan-EOS (D. Freeman, J. Dozier et al.); 1 at MINWR 21 Feb (L. Manfredi, J. Rosenfield).

Pacific Loon: 1 at Fort Pickens (*Escambia*) 23 Dec (B. Duncan) and 1 Jan (S. Moske); 1 at Gulf Breeze (*Santa Rosa*) 25 Dec (B. and L. Duncan); 1 at Alligator Point 14 Jan (K. LaBorde) and 27 Feb (J. Dozier).

Common Loon: 3 at Lake Jackson (*Leon*) 16 Dec-15 Feb (R. West, G. Menk); 3 at Lake Arietta (*Polk*) 22 Jan (L. Albright); 1 at PPM 25 Jan (P. Fellers); **28** at Lake Weir (*Marion*) 30 Jan (E. Scales, I. Franzen); 1 at MINWR swallowed a 20-cm stingray 7 Feb (B. and L. Cooper, J. and K. Bearden); 13 at Lake Santa Fe (*Alachua*) 12 Feb (M. Manetz).

Horned Grebe: 10 at Lake Jackson 16 Dec (R. West, G. Menk); 100+ at MINWR 22 Jan (C. Paine, C. Pierce); 5 at Lake Arietta 22 Jan (L. Albright); 4 at Bivens Arm (*Alachua*) 29 Jan (M. Landsman); **484** at Lake Weir 30 Jan (E. Scales, I. Franzen); 16 at Lake Santa Fe 12 Feb (M. Manetz).

Eared Grebe: 1 at FWBSTF 14 Dec (D. Ware); 6 at PPM 8 Jan (C. Geanangel, P. Timmer); 1 at W Kendall (*Miami-Dade*) 12 Feb-EOS (J. Villamil, K. Sarsfield, J. Boyd et al.).

Sooty Shearwater: 1 at Fort Pickens 23 Dec (B. Duncan).

Northern Gannet: 400 at Bald Point (*Franklin*) 8 Jan (J. Dozier); 100s at Alligator Point 11 Jan (D. Freeman); 500 or more at New Smyrna Beach (*Volusia*) 25 Dec (G. Stoccardo); 600 at Fort Pickens 22 Jan (B. Duncan); 100s at Playalinda Beach (*Brevard*) 7 Feb (B. and L. Cooper, J. and K. Bearden); "quite a few" at Anclote Key State Preserve (*Pasco*) 14 Jan (W. Yusek).

American White Pelican: 10 at Shell Key (*Pinellas*) 19 Jan (P. Blair); 2000 at PPM 10 Feb (P. Fellers et al.); 22 wintered at Lake Jackson (G. Menk et al.); 150 at PPSP through the season (J. Hintermister, H. Adams et al.).

Brown Pelican: 6 or more adults and immatures wintered at various sites in *Polk* (*fide* L. Cooper).

American Bittern: 1 at the Wakulla River (*Wakulla*) 18 Feb (T. Kennedy).

Least Bittern: 1 at Bivens Arm 19 Dec (M. Paczolt, L. Davis); 1 at Fort Drum MCA (*Indian River*) 8 Feb (S. Rowe).

"Great White Heron:" 2 at HISRA 10 Dec (W. Yusek).

Cattle Egret: 3 along the St. George Island causeway (*Franklin*) through Jan (D. and J. Devlin); 2 in *Gadsden* 25 Jan (G. Menk).

Green Heron: 1 in *Gadsden* 28 Jan (G. Menk).

Black-crowned Night-Heron: 1 at San Luis Mission Park (*Leon*) 1 Jan (*fide* K. Ne-Smith) and 1 Feb (G. Menk).

Glossy Ibis: 5 at Lake Jackson 1 Jan (G. Menk, D. and J. Houle).

White × Scarlet Ibis: 1 pink individual at Eco Pond, ENP (*Monroe*) 16 Jan (B. Pranty et al.).

Roseate Spoonbill: 1 at Mountain Lake (*Polk*) 13 Jan (P. Pierson); 4 at SMNWR to 31 Jan (*fide* J. Reinman); 13 at PPM 10 Feb (P. Fellers et al.); 2 wintered at PPSP (J. Hintermister, B. Simons).

Wood Stork: 500 at PPSP 4 Dec (H. Adams); 1 at SMNWR 28 Jan-EOS (J. Reinman et al.).

Greater Flamingo: 1 presumed escapee at Sarasota Bay (*Manatee*) 10-12 Dec (C. Everly, A. Bishop); 32 wintered at Snake Bight, ENP (*Monroe*) (J. Boyd, J. Villamil et al.).

Black-bellied Whistling-Duck: 6 at PPSP 12 Dec (J. Hintermister, H. Adams); **500** near Venice (*Sarasota*) 28 Feb (A. Rawson).

Greater White-fronted Goose: 1 at FWBSTF 14-23 Dec (D. Ware).

Snow Goose: 4 white morphs at Broadmoor Marsh (*Brevard*) to early Dec (S. Rowe); 13 at LARA 7 Dec only (H. Robinson); 6 (4 white and 2 blue) at T. M. Goodwin WMA (*Brevard*) in Dec (S. Rockwood); 6 white morphs in W *Duval* 15 Dec (Roger Clark); 1 white morph N of Auburndale (*Polk*) 15-17 Dec (T. Palmer, C. Geanangel); 8 at SMNWR 26 Dec (J. Mullins); 48 at PPSP to 1 Jan (J. Hintermister et al.).

Ross's Goose: 1 remained at Crystal River (*Citrus*) through the winter (B. Ahern, W. Biggs et al.).

Canada Goose: 2 at Goodwin WMA in mid-Dec (S. Rockwood); 1 at Crystal River 17 Jan (D. Goodwin, E. Haney); 1 at the Kissimmee River (*Highlands* and *Okeechobee*) 6-7 Feb (D. McCoy, L. Albright); 1 at Sanford (*Seminole*) 7 Feb (K. LaBorde); 12 at Leesburg (*Lake*) 28 Feb (T. Rogers); 4 wintered at Bayonet Point (*Pasco*) (D. Bornemann et al., photos by B. Pranty).

Brant: 1 at St. Augustine (*St. Johns*) 18 Dec (D. Reed).

Muscovy Duck: a brood of 16 hatchlings at Brandon (*Hillsborough*) 17 Dec (B. Pranty).

Green-winged Teal: 450 at PPM 26 Feb (P. Fellers et al.); 2870 wintered at LARA (H. Robinson).

American Black Duck: 2 wintered at LARA (H. Robinson).

Northern Pintail: 100 at PPM 5 Dec (P. Fellers, L. Albright); 194 wintered at LARA (H. Robinson).

Gadwall: 32 at PPM 5 Dec (P. Fellers, L. Albright); 1 at New Port Richey (*Pasco*) 30 Dec (K. Tracey et al.); 92 wintered at LARA (H. Robinson).

American Wigeon: 950 at PPM 5 Dec (P. Fellers, L. Albright).

Canvasback: 300 at Lake Seminole (*Jackson*) 13 Jan (D. Harder); 1 at Bivens Arm 17 Jan-3 Feb (J. Bouton, C. Ewell et al.); 115 at PPM 10 Feb (P. Fellers et al.); 1 female at Tierra Verde (*Pinellas*) 17 Feb-EOS (L. Atherton et al.).

Redhead: 200 at Big Sabine (*Escambia*) 8 Dec (B. and L. Duncan et al.); 1 at Little Lake Jackson (*Leon*) 16 Feb (G. Menk).

Ring-necked Duck: 3,500 at PPM 26 Feb (P. Fellers et al.).

Greater Scaup: 2 at LARA to 14 Dec, with 1 remaining to 2 Feb (H. Robinson); 2 at Hernando Beach (*Hernando*) 27 Dec (B. Pranty, D. Goodwin, B. Ahern).

Lesser Scaup: 10,000 at the Peace River mouth (*Charlotte*) 10 Dec (J. Bouton); **500,000** at MINWR 30 Dec (D. and P. Fellers); 170 at Lake Weir 30 Jan (E. Scales, I. Franzen).

Common Eider: 3 at Port Canaveral (*Brevard*) variously this winter (D. Simpson et al.).

Black Scoter: 150 at Alligator Point 4 Jan (P. Fellers et al.); 250+ at Bald Point 5-8 Jan (J. Dozier).

Surf Scoter: 1 at Gulfport (*Pinellas*) 18-29 Dec (M. Wilkinson).

White-winged Scoter: 1 female at PPM 8 Jan (C. Geanangel, P. Timmer et al.).

Common Goldeneye: 1 at Lake Talquin (*Leon*) 11 Dec (G. Menk); 1 at N Jacksonville (*Duval*) 26 Dec-30 Jan (Roger Clark); 20 at Bald Point 7 Jan (D. Harder); 14 at Fort

Island CP (*Citrus*) 23 Jan (C. Kelsey); 3 at Gainesville (*Alachua*) to 18 Feb (R. Rowan); 24 at the Florida Power plant, Crystal River (*Citrus*) 17 Feb (T. Rogers, A. and B. Hansen et al.).

BUFFLEHEAD: 5 at PPM 5 Dec (P. Fellers et al.); 9 at LARA 30 Dec-1 Jan (H. Robinson); 1 at Lake Ariana 16 Jan (L. Albright, C. Geanangel); **73** at Lake Weir 30 Jan (E. Scales, I. Franzen).

RED-BREASTED MERGANSER: 2 at PPM 5 Dec (P. Fellers, L. Albright); 16 at Lake Talquin 11 Dec (G. Menk, D. Harder); 2 at Newnans Lake 8-13 Jan (M. Manetz, A. Kratter); 27 at Lake Weir 30 Jan (E. Scales, I. Franzen).

COMMON MERGANSER: 1 apparent immature male at Pine Island CP (*Hernando*) 27 Dec (D. Goodwin, B. Pranty, B. Ahern).

RUDDY DUCK: 2,000 at PPM 8 Jan (P. Fellers et al.).

SWALLOW-TAILED KITE: 1 at Zolfo Springs (*Hardee*) 21 Feb (B. Ackerman); 1 in *Franklin* 29 Feb (H. Van Tol).

WHITE-TAILED KITE: 6 wintered at BCC (J. Boyd et al.).

BALD EAGLE: 154 on the Gainesville CBC 19 Dec (*fide* B. Muschlitz).

NORTHERN HARRIER: **223** wintered at LARA (H. Robinson), the highest count in Florida.

RED-SHOULDERED HAWK: 28 wintered at LARA (H. Robinson).

BROAD-WINGED HAWK: 1 at East Lake Park (*Hillsborough*) 8 Dec-12 Feb (D. Wassmer, L. Saul); 1 at Valparaiso (*Okaloosa*) 20 Dec (P. Baker, J. Cameron, C. Parkel, details to FOC); 1 at MINWR 13 Jan (B. Ahern, R. Webb); 1 at LARA 18 Jan (H. Robinson); 1 at Dunedin Hammock City Park (*Pinellas*) 5 Feb (K. Nelson, L. Hopkins et al.); 1 at Masaryktown (*Hernando*) 16 Feb (C. Black); 1 adult at Turkey Creek Sanctuary (*Brevard*) 17-20 Feb (B. and S. Hills).

SHORT-TAILED HAWK: 1 dark morph at Tiger Creek (*Polk*) 2 Jan (B. and L. Cooper); 1 light morph at Bramble Ridge (*Polk*) 9 Feb (L. Lane, M. Chakan et al.); 1 light morph at Highlands Hammock SP (*Highlands*) 19 Feb (B. Ackerman); 1 dark morph at Tenoroc State Reserve (*Polk*) 19 Feb (P. Fellers et al.); 1 dark morph at Poinciana (*Osceola*) 29 Feb (Ruth Clark).

SWAINSON'S HAWK: 1 dark morph at LARA to 21 Jan (H. Robinson, P. Bowen et al.); 1 immature light morph at Kendall 21 Jan (E. Kwater).

RED-TAILED HAWK: 61 wintered at LARA (H. Robinson).

"KRIDER'S RED-TAILED HAWK:" 1 at Moccasin Island Restoration Area (*Brevard*) 26 Jan (S. Rowe); 1 at BCC 13-23 Feb (J. Boyd); 2 wintered S of Palm Bay (*Brevard*), where 2 wintered last year (S. Rowe).

*ROUGH-LEGGED HAWK (*Buteo lagopus*): 3 (1 light morph, 2 dark morphs) at LARA 16 Feb-EOS (H. Robinson et al., photos to FOC by K. Radamaker, H. Weatherman, note in prep. by K. Radamaker) were the first verifiable Florida record.

CRESTED CARACARA: birds seen regularly at Moccasin Island Restoration Area (S. Rowe).

AMERICAN KESTREL: 24 wintered at LARA (H. Robinson).

PEREGRINE FALCON: 1 at PPSP 10 Dec-15 Jan (C. Parenteau, A. Kratter, A. Kent); 1 at LARA 2 Feb (H. Robinson); 1 at PPM 19 Feb (C. Geanangel, P. Timmer).

RING-NECKED PHEASANT: 1 male at Lake Woodruff NWR (*Volusia*) 13 Jan (R. Peterson).

WILD TURKEY: 1 female at Boca Ceiga Park, St. Petersburg (*Pinellas*) 9 Jan (J. Shrewsbury) has been present for at least a year.

BLACK RAIL: 2 responded to a tape in SW *Hernando* 27 Dec (B. Ahern, D. Goodwin, B. Pranty).

PURPLE GALLINULE: 1 at Wakulla Springs SP (*Wakulla*) 18 Feb (H. Hooper et al.); 24 at Leesburg 28 Feb (T. Rogers).

AMERICAN COOT: 30,000 at PPM 5 Dec (P. Fellers, L. Albright); 7 with yellow or yellowish bills at Eco Pond, ENP in Jan (B. Pranty [photos to FOC], G. Stoccardo et al.).

SANDHILL CRANE: 7 at SMNWR 1 Dec (M. Keys); 4882 at PPSP 19 Dec (J. Hintermister, S. Nesbitt et al.); 2 "tiny" chicks at Alafaya STF (*Orange*) 21 Jan (C. Pierce); 1 at Ce-

dar Key (*Levy*) 19 Feb (D. Henderson); 43 wintered at Eagle Ridge Mall (*Polk*) (S. Riffe et al.).

Whooping Crane: 1 near Mascotte (*Lake*) 26 Dec (D. and S. Bowman) and 29 Jan (B. and L. Atherton); 2 W of Fort Pierce (*St. Lucie*) 5 Feb (D. and H. Hull); 1 near Riverview (*Hillsborough*) 13 Feb (D. Bowman); 3 wintered in central *Pasco* (*fide* B. Pranty).

Black-bellied Plover: 1 at Lake Jackson 16 Dec-16 Feb (G. Menk, R. West et al.); 10 at Newnans Lake 9 Jan-EOS (R. Rowan, H. Adams et al.); 138 wintered at BCC (J. Boyd et al.); 38 wintered at LARA (H. Robinson).

Snowy Plover: 12 at Big Sabine 8 Dec (B. and L. Duncan et al.); 1 at Talbot Island SP (*Duval*) 10 Dec-3 Feb (P. Leary et al.).

Wilson's Plover: 27 at Black Hammock Island, Jacksonville 7 Jan (Roger Clark); **150** at HISRA 19 Feb (E. Kwater).

Semipalmated Plover: 11 at PPM 6 Feb (C. Geanangel, P. Timmer).

Black-necked Stilt: 1 at HPM 18 Dec (J. Krummrich); 14 wintered at PPM (P. Fellers, L. Albright, C. Geanangel, P. Timmer).

American Avocet: 238 at PPM 5 Dec (P. Fellers, L. Albright); 26 at SMNWR 2 Feb (J. Reinman et al.); 1 at Newnans Lake 11 Feb-EOS (E. Scales, H. Adams et al.); 5 wintered at Lake Jackson (G. Menk et al.).

Solitary Sandpiper: 2 at Kendall 19-20 Dec (J. Boyd); 1 at PPSP 7 Jan (M. Meisenburg); 1 at Sarasota (*Sarasota*) 22-25 Jan (J. Bouton); 1 in *Lee* 9 Feb (V. Lucas); 1 at Bramble Ridge 9 Feb (L. Lane et al.).

Spotted Sandpiper: 1 wintered at Hague Dairy (*Alachua*) (L. Davis, R. Rowan); 1 at HPM 18 Dec (J. Krummrich).

Whimbrel: 1 at Key Vista CP, Anclote (*Pasco*) throughout Dec (K. Tracey et al.).

Long-billed Curlew: 1 at Bay Vista Park (*Pinellas*) 3 Dec (P. Blair, W. Biggs, J. and L. Hopkins); 1 at Cedar Key 30 Dec (*fide* D. Henderson); 3 at Three Rooker Bar (*Pinellas*) 15 Feb (P. Blair); 2 at Shell Key 18 Feb (P. Blair); 2 wintered at HISRA (W. Yusek et al.).

Marbled Godwit: 2 at Key Vista CP throughout Dec (K. Tracey et al.).

Hudsonian Godwit: 1 in Hillsborough Bay (*Hillsborough*) 19 Dec (R. Paul, A. Schnapf).

Western Sandpiper: 5 at Newnans Lake 9 Jan-EOS (R. Rowan, H. Adams et al.).

Pectoral Sandpiper: 1 at Tram Road STF (*Leon*) 10 Dec (G. Menk).

Purple Sandpiper: 11 at Fernandina Beach (*Nassau*) 28 Feb (K. Allen); 5 at Smyrna Dunes Park (*Volusia*) 26 Jan (K. Radamaker, B. Pranty); 1 at Gulf Breeze 27 Feb-EOS (B. and P. Tetlow, B. Duncan et al.).

Dunlin: 98 at Newnans Lake 9 Jan-EOS (R. Rowan, M. Manetz et al.); 23 wintered at LARA (H. Robinson).

Stilt Sandpiper: 2 at Lake Pasadena (*Pasco*) 21 Dec (B. Pranty, P. Young, R. Grant); 12 at Newnans Lake 9-23 Jan (R. Rowan); 2 at SMNWR 15 Jan (J. Reinman); 1 at FWB-STF 25 Feb (A. Knothe); 68 wintered at LARA (H. Robinson).

Ruff: 1 female at Newnans Lake 12 Jan-EOS (R. Rowan, B. Muschlitz et al., photos to FOC by A. Kratter).

Long-billed Dowitcher: 44 at N Jacksonville 26 Dec (Roger Clark, M. Dolan); 1 at Seven Springs (*Pasco*) 30 Dec (D. Goodwin, E. Haney); 493 wintered at LARA (H. Robinson).

American Woodcock: 1 at Boyd Hill Nature Park, St. Petersburg 2 Dec (B. Hoffman); 3 in courtship flights at Croom Road (*Hernando*) 13 Dec-6 Jan (A. and B. Hansen et al.).

Red Phalarope: 14 off Mayport (*Duval*) 2 Jan (Roger Clark).

Parasitic Jaeger: 1 at Anclote Key State Preserve 13 Jan (W. Yusek); singles at HISRA 29 Jan (E. Kwater) and 8 Feb (R. Webb), and 2 there (light morph and dark morph adults) 10 Feb (E. Kwater); 1 at Fort DeSoto CP (*Pinellas*) 30 Jan (E. Kwater).

Franklin's Gull: 1 at Lake Jackson 1-9 Jan (J. Cavanagh, G. and S. Hampton et al.); 1 at Redington Beach (*Pinellas*) 1 Dec ff (L. Atherton et al., photos to FOC); 1 at FWB-STF 23 Dec (D. Ware).

Black-headed Gull: 1 adult at Alafaya STF 26 Dec (S. Dodgson, photos to FOC); 1 at Newnans Lake 15 Jan (M. Manetz et al.).

Bonaparte's Gull: 350+ at Alafaya STF 8 Jan (C. Pierce).

*California Gull: 1 immature near Eastpoint (*Franklin*) 11-14 Dec (H. Horne, T. Kennedy, S. Wright).

Herring Gull: 6 wintered at LARA (H. Robinson).

Lesser Black-backed Gull: among 11 reports are these: 4 at Stock Island (*Monroe*) 14 Dec (B. Boeringer); 1 at Pine Island (*Lee*) 20 Dec (C. Ewell); 1 at Port Charlotte (*Charlotte*) 29 Dec (F. Frazier); 1 at Pine Island CP 29 Dec (A. and B. Hansen); 6 at Siesta Key (*Sarasota*) 14 Jan (A. Rawson); 1 at Lake Kissimmee (*Osceola*) 16 Jan (J. Boyd); 4 adults at Huguenot Park, Jacksonville 30 Jan (Roger Clark); 4 wintered at Snake Bight, ENP (J. Boyd).

Gull-billed Tern: 2 at Pine Island CP 27 Dec (B. Pranty [photos to FOC], P. Young, S. Collins); 1 at Key Vista CP 1 Jan fed on fiddler crabs (K. Tracey, photos to FOC); 1 at PPM 6 Feb (C. Geanangel, P. Timmer).

Caspian Tern: 190 at PPM 25 Jan (P. Fellers et al.); 189 wintered at LARA (H. Robinson).

Royal Tern: 24 at PPM 8 Jan (P. Fellers et al.).

Common Tern: 1 with a carpal bar at New Port Richey 30 Dec (C. Kelsey et al.).

Forster's Tern: 650 at PPM 8 Jan (P. Fellers et al.); 75 at Lake Jackson 1 Feb (G. Menk).

Black Skimmer: 380 at North Shore Park 12 Dec (R. Smith); 2000+ at Snake Bight, ENP 16 Jan (P. Fellers et al.); 1 at LARA 16 Feb (H. Robinson).

White-winged Dove: 1 at Eastpoint 12 Dec (K. Avera, J. Dozier); 2 at Lutz (*Pasco*) 26 Jan (D. Bowman); 1 at Valrico (*Hillsborough*) 18 Feb (S. Backes).

Budgerigar: 52 at Bayonet Point (*Pasco*) 5 Dec (K. Tracey); 3 at Anna Maria Island (*Manatee*) 25 Dec (L. Snyder); 39 at Hernando Beach 26-27 Dec (A. and B. Hansen, B. Pranty et al.).

Black-hooded Parakeet: 50 at Sarasota 18 Dec (C. Everly).

Blue-crowned Parakeet: 4 at Lassing Park 3 Dec (W. Biggs); 12 at Anna Maria Island 4 Dec (W. Stinehelfer).

Blue-and-yellow Macaw: 3 at Coral Gables (*Miami-Dade*) 2-3 Jan (V. Lucas et al.).

Groove-billed Ani: 1 at Bonita Springs (*Lee*) 15-16 Dec (L. Davis); 1 at LARA 8 Feb (H. Robinson).

***Snowy Owl** (*Nyctea scandiaca*): 1 at St. George Island SP (*Franklin*) 8-24 Dec (J. Cavanagh et al.) and Bald Point SP 31 Dec-9 Jan (J. Dozier, K. Avera et al.) will be the first verifiable Florida record, pending FOSRC acceptance.

Burrowing Owl: 2 N of Auburndale 8 Dec (L. Albright).

Short-eared Owl: 1 at PPSP 4 Dec (B. Muschlitz, M. Landsman et al.); 1 at Genoa (*Hamilton*) 5 Dec (B. Bergstrom); 3 at Lake Jackson 12 Dec-24 Jan (G. and S. Hampton, M. Hill et al.); 1 at Big Lagoon SP (*Escambia*) 27 Dec (B. Bremser, D. Zani, T. McCaskey); singles in *Wakulla* 5 Jan (P. Burns) and 12 Jan (A. Morrow); 1 at Siesta Key 9 Jan (T. Day); 1 at Navarre Flats (*Santa Rosa*) 29-30 Jan (B. Garmon, L. Gardella et al.); 1 at Crystal River 17 Feb (A. and B. Hansen, T. Rogers et al.); 3 wintered at LARA (H. Robinson et al.); 4 wintered at BCC (J. Boyd et al.).

African Gray Hornbill: 1 on the Brooksville CBC (*Hernando*) 23 Dec had been present for 3 years (C. Black).

Lesser Nighthawk: 4 at Eco Pond, ENP 25-26 Jan (D. Simpson).

Chuck-will's-widow: 1 singing at Naples (*Collier*) 23 Feb (H. McGuinness); 2 at Boyd Hill Nature Park 26 Feb (P. Blair).

Whip-poor-will: 3 wintered at Boyd Hill Nature Park (R. Smith, B. Hoffman et al.); 1 at Weekiwachee Preserve (*Hernando*) 14 Dec ff (A. and B. Hansen et al.).

Buff-bellied Hummingbird: 1 near Wellington (*Palm Beach*) 3-16 Dec (A. Hall et al.); 1 at Gulf Breeze 24 Dec-12 Feb (B. and C. Kahn et al., banded on 12 Feb by F. Bassett).

Ruby-throated Hummingbird: 1 at Tallahassee 6 Dec and 2 other singles wintered there (J. Cavanagh, H. Hooper, G. Menk et al.); 1 at Pensacola (*Escambia*) 21 Dec had been banded four years earlier (F. Bassett et al.); 1 at Alachua (*Alachua*) 29 Feb (P. Burns); 3 wintered at Lakeland (*Polk*) (J. Misiaszek et al.).

Black-chinned Hummingbird: 4 singles at Tallahassee on various dates (H. Hooper, J. Cavanagh, P. Conover, J. O'Malley et al.); 1 adult male at Gainesville 6 Dec-EOS (D. Beatty et al.); 1 at LARA 19 Dec (H. Robinson); 2 females banded at Pensacola 21 Dec (F. Bassett et al.); 1 female at St. Leo (*Pasco*) 21 Dec-early Jan (R. Grant, P. Young, B. Pranty et al.).

*Calliope Hummingbird: 1 immature male at Pensacola 18 Dec-EOS (P. Baker et al., banded on 21 Dec by F. Bassett).

Rufous Hummingbird: 1 adult male at Gainesville 1 Dec (*fide* B. Roberts); 1 female at Pensacola 21 Dec had been banded the previous year (F. Bassett et al.).

Selasphorus species: 3 wintered at Gainesville (B. Roberts, E. Perry, D. Fagan et al.).

Hairy Woodpecker: 1 at Kanapaha Prairie (*Alachua*) 9 Jan (M. Manetz); 1 at Bear Creek Trail SP (*Gadsden*) 15 Jan (G. Menk, D. Harder); 1 at LARA 11 Feb (H. Robinson).

Least Flycatcher: 1 at Fort DeSoto CP 1 Jan-EOS (R. Smith, B. Ahern et al., photos to FOC by L. Atherton); 1 at LARA 25 Feb (L. Atherton, B. Anderson, J. Baker et al.).

Eastern Phoebe: 62 wintered at LARA (H. Robinson).

Vermilion Flycatcher: 1 immature male at FWBSTF 5 Dec-15 Jan (B. and P. Tetlow, B. Bremser et al.); 1 at PPSP 19 Dec (G. McDermott); 1 male near Magnolia Park (*Orange*) 20 Dec-EOS (K. Radamaker et al.); 1 male along the Kissimmee River (*Highlands* and *Okeechobee*) 29 Jan-7 Feb (D. McCoy, L. Albright); 1 at Sanford 5 Feb (K. LaBorde); 1 at DeBary (*Volusia*) 7 Jan-EOS (L. Malo et al.); 1 again wintered at Micanopy (*Alachua*) (R. Rowan et al.); 1 female again wintered at Goodwin WMA (S. Rowe et al.).

Ash-throated Flycatcher: 2 at FWBSTF 10 Dec-15 Jan (D. Ware, L. Duncan et al.), the 4th year birds have wintered there; 1 at Brooker Creek Preserve (*Pinellas*) 26 Dec (A. and R. Smith); 1 at Bald Point 2 Jan-3 Feb (D. and J. Houle, A. and B. Hansen et al.); **5** wintered at LARA (*Lake* and *Orange*) (B. Pranty [photos to FOC], J. Bouton, C. and K. Radamaker, H. Robinson et al.), with **3** seen 23 Feb (H. Robinson).

Great Crested Flycatcher: 1 at Alachua 19 Feb (P. Burns); 1 at San Felasco Hammock State Preserve (*Alachua*) 20 Feb (G. Jones); 1 calling at Port Charlotte (*Charlotte*) 21 Feb (J. Bouton); 1 calling in *Osceola* 27 Feb (B. Anderson, B. Payne, J. Baker).

Brown-crested Flycatcher: 1 at Anhinga Trail, ENP (*Miami-Dade*) 4 Dec (*fide* J. Boyd); 1 at ENP, Snake Bight 14 Jan (R. Smith).

*Cassin's Kingbird: 1 at LARA 4 Dec-EOS (H. Robinson et al., photos to FOC by K. Radamaker and B. Pranty).

Western Kingbird: 8 near Corkscrew Swamp Sanctuary (*Collier*) 18 Dec (R. Wooster et al.); 3 at Weekiwachee Preserve 27-28 Dec (R. Grant, P. Young, A. and B. Hansen); 1 at Cedar Key 30 Dec-20 Feb (D. Henderson); 5 at the SW corner of LARA 3 Mar (D. Freeman et al.) and **33** wintered at the E side (H. Robinson et al.); 1 wintered at Seven Springs (*Pasco*) (K. Tracey et al.).

Eastern Kingbird: 1 at Fort Walton Beach (*Walton*) 20 Dec (H. Huddleston, G. Simpson, details to FOC).

Gray Kingbird: 1 at Research Road, ENP (*Miami-Dade*) 12-15 Dec (J. Boyd).

Scissor-tailed Flycatcher: 3 W of Astatula (*Lake*) 11 Dec (T. Palmer); 1 at Weekiwachee Preserve 28 Dec (A. and B. Hansen); 1 near Riverview 5 Jan-5 Feb (K. Tracey, S. Gross, S. Backes et al.); 1 N of Palmetto (*Hillsborough*) 15 Jan ff (K. Tracey et al.); 4 near Mahogany Hammock, ENP 20 Jan (E. Kwater); 3 wintered at LARA (*Lake* and

Orange) (H. Robinson, G. Basili, S. Rallo et al.); 1 wintered at Seven Springs (D. Robinson, K. Tracey [photos] et al.).

BELL'S VIREO: 1 at LARA 6-16 Feb (H. Robinson).

YELLOW-THROATED VIREO: 1 at Matheson Hammock CP (*Miami-Dade*) 27 Jan ff (P. W. Smith et al.); 1 at Royal Palm, ENP (*Miami-Dade*) 3 Feb (V. Lucas et al.).

PURPLE MARTIN: 1 male at Bald Point 9 Jan (B. and P. Tetlow, D. Timmons et al.); 2 at Lutz (*Hillsborough*) 23 Jan (D. Grimes); "a few" at St. Petersburg 24 Jan (B. Ackerman); 2 at Port St. Lucie 24 Jan (D. Hull); 2 at Cape Coral (*Lee*) 24 Jan (C. Ewell); 6 at PPM 25 Jan (P. Fellers et al.).

CAVE SWALLOW: 22 at BCC 5 Dec, and **230** there 26 Jan (both J. Boyd); "several" at Anhinga Trail, ENP 9 Jan (B. Boeringer) and 6 there 20 Jan (E. Kwater et al.).

BARN SWALLOW: 1 at Springhill Road STF (*Leon*) 17 Jan (G. Menk); 1 at LARA 16 Feb-EOS (H. Robinson).

CAROLINA CHICKADEE: 1 at Boyd Hill Nature Park 18 Dec-EOS (R. Smith et al.) was the first on the St. Petersburg CBC since 1965.

BROWN CREEPER: birds were "widespread" in *Gadsden*, *Leon*, and *Wakulla* this winter (*fide* G. Menk); 1 at San Felasco Hammock State Preserve 12 Dec-25 Feb (M. Manetz, P. Burns et al.).

*BEWICK'S WREN: 1 at LARA 25 Feb and 14 Mar (H. Robinson).

HOUSE WREN: 139 wintered at LARA (H. Robinson).

WINTER WREN: 2 at Swift Creek (*Hamilton*) 18 Dec (M. Manetz, G. McDermott); 2 or more at Newnans Lake 6 Jan-1 Feb (M. Manetz, L. Davis et al.); 1 in N *St. Johns* 23 Jan (P. Powell).

SEDGE WREN: 44 wintered at LARA (H. Robinson).

MARSH WREN: 1 at Black Swamp (*Leon*) 31 Jan-12 Feb (D. Harder, G. Menk); **109** wintered at LARA (H. Robinson).

GOLDEN-CROWNED KINGLET: birds "reported readily" in *Gadsden*, *Leon*, and *Wakulla* this winter (*fide* G. Menk); singles at LARA 7 Dec and 25 Jan (H. Robinson); 2 at Odessa (*Pasco*) 30 Dec (K. Tracey et al., photo to FOC); 1 at Bok Tower (*Polk*) 2 Jan (B. Bratlie, M. Loftus); 11 in *Alachua* through 25 Feb (P. Burns et al.).

RUBY-CROWNED KINGLET: 1 at Royal Palm Hammock, ENP (*Miami-Dade*) 19 Feb (J. Boyd).

EASTERN BLUEBIRD: a clutch of 5 eggs at Kanapaha Prairie 22 Feb (M. Meisenburg).

WOOD THRUSH: 1 at Sugden Park, Naples (*Collier*) 2 Jan (K. and T. Doyle).

AMERICAN PIPIT: 100 at Lake Jackson 22 Feb (G. Menk); 172 wintered at LARA (H. Robinson).

SPRAGUE'S PIPIT: singles at Eglin Air Force Base (*Okaloosa* and *Walton*) 19 Feb (C. Parkel) and 26 Feb (D. Ware, L. Fenimore, C. Parkel).

ORANGE-CROWNED WARBLER: 15 at LARA 29 Feb (H. Robinson).

NASHVILLE WARBLER: 1 immature female at Lakes Park, Fort Myers 6-7 Dec (L. Atherton); 1 at MINWR 13 Feb (C. Paine); 1 at Turkey Creek Sanctuary 14 Feb-EOS (D. Simpson et al.).

NORTHERN PARULA: 1 in W *Gadsden* 28 Jan (D. Harder); 1 at PPSP 30 Jan (R. Rowan); 4 at LARA 29 Feb (H. Robinson).

MAGNOLIA WARBLER: 1 at Lutz (*Pasco*) 6 Dec (D. Bowman); 1 at John U. Lloyd SRA (*Broward*) 11 Dec (S. Epps); 1 at Crews Lake CP (*Pasco*) 27 Dec (D. Robinson, T. Rogers et al.); 1 at Snake Bight, ENP 2 Jan (B. Boeringer).

BLACK-THROATED GREEN WARBLER: 1 at Corkscrew Swamp Sanctuary 7 Dec (P. Hockey); 1 in coastal *Hernando* 12-24 Dec (S. Collins); 1 at Brooker Creek Preserve 26 Dec (*fide* R. Smith); 1 at Royal Palm Hammock, ENP 9 Jan (B. Boeringer); 1 male at S Jacksonville 23 Jan-5 Feb (J. Cocke); 2 at Matheson Hammock CP (*Miami-Dade*) 27 Jan (P. W. Smith et al.) and 1 there 26 Feb (E. Haney, B. Pranty, photo to FOC, note in prep.); 1 at Dunedin Hammock City Park 5 Feb (J. and L. Hopkins, J. Fisher et al.); 1 female at

MINWR 13-19 Feb (S. Rallo, P. Bowen, C. Paine); 1 at Sarasota 27 Feb (J. Palmer); 5 wintered at Royal Palm Hammock, ENP (J. Boyd et al.).

*Townsend's Warbler: 1 adult male at MINWR 19 Feb-EOS (C. Paine et al.).

Blackburnian Warbler: 1 at Gainesville 2 Dec (J. Taylor).

Prairie Warbler: 1 male in S Jacksonville 3 Dec-EOS (P. Powell).

American Redstart: 1 at "Ding" Darling NWR (*Lee*) 9 Dec (P. Hockey); 1 immature male at Tallahassee in Jan (H. Horne); 1 at PPSP 19 Feb (A. Kratter, R. Rowan); 1 adult male at Turkey Creek Sanctuary 20 Feb-EOS (B. and S. Hills); 1 male wintered at Gainesville for the third year (M. Manetz et al.).

Worm-eating Warbler: 1 at John U. Lloyd SRA 11 Dec-10 Jan (S. Epps).

Ovenbird: 1 in *Wakulla* 27 Jan (J. Epler).

Northern Waterthrush: 1 in *Hillsborough* 2 Jan (R. Paul); 1 wintered at LARA (H. Robinson).

Common Yellowthroat: 68 wintered at LARA (H. Robinson).

Hooded Warbler: singles at PPSP 16 Jan (M. Rose) and 11 Feb (A. Kratter).

Wilson's Warbler: 1 male at Lutz (*Pasco*) 6-22 Dec (D. Bowman, R. Webb); 1 male at S Jacksonville 7 Dec-EOS (P. Powell); 8 at Gainesville through 19 Feb, including **7** on 19 Dec (B. Roberts, A. Kratter et al.); 1 at W Kendall 20 Dec-EOS (J. Boyd); 1 at LARA 3-8 Feb (R. Webb, H. Robinson); 1 female at Black Swamp 7-8 Feb (G. Menk); 1 at Turkey Creek Sanctuary 13 Feb (D. Simpson).

Yellow-breasted Chat: 1 at PPSP 11 Dec (R. Rowan); 1 at Royal Palm, ENP 12 Dec-EOS (J. Boyd et al.); 1 at Eco Pond, ENP 2 Jan-19 Feb (B. Boeringer, J. Boyd et al.).

Bananaquit: 1 at Hugh Taylor Birch SRA (*Broward*) remained to 2 Dec (W. George).

Summer Tanager: 1 female at Lake Trafford (*Collier*) 19 Dec (K. and T. Doyle, details to FOC); 1 male at Niceville (*Okaloosa*) 20 Dec (G. and N. Estes); 1 at Loxahatchee NWR (*Palm Beach*) 22 Jan (B. Boeringer); 1 female at Spring Hill (*Hernando*) to 31 Jan (A. and B. Hansen).

Western Tanager: 1 at Melrose (*Alachua*) 18 Feb (B. Lever).

Clay-colored Sparrow: 1 at Fort Pickens 2 Dec (B. Duncan, E. Case); 3 at LARA 11 Jan (H. Robinson); 1 at Talbot Island SP 17-26 Dec (R. Rowan); 1 at HPM 18-28 Dec (M. Manetz, G. McDermott, J. Krummrich); 2 at Oviedo (*Seminole*) 2 Jan (B. Anderson); 1 at BCC 3 Jan (J. Boyd); 2 at Tangerine (*Orange*) 15 Jan-20 Feb (C. Paine, C. Pierce, D. Reed); 9 in E *Polk* 30 Jan (C. Geanangel, P. Timmer, L. Albright).

Vesper Sparrow: 20 at Tangerine 31 Jan (D. Simpson, K. LaBorde); 15 at LARA 29 Feb (H. Robinson).

Savannah Sparrow: 235 wintered at LARA (H. Robinson).

Grasshopper Sparrow: 15 at PPSP 4 Dec-1 Jan (J. Hintermister et al.); 15+ at Tangerine 6 Jan (B. Ahern); 1 at Wakodahatchee Wetlands (*Palm Beach*) 22 Jan (B. Boeringer); 1 at Lake Louisa SP (*Lake*) 5 Feb (T. Palmer); 4 wintered at BCC (J. Boyd).

Henslow's Sparrow: 12 at PPSP 4 Dec-1 Jan (J. Hintermister et al.); singles E of Dade City 5 and 21 Dec (A. and R. Smith); 1 at Tall Timbers Research Station (*Leon*) 15 Dec (D. Harder); 1 at Crews Lake CP 27 Dec (D. Robinson, T. Rogers et al.); 1 at Santa Fe Swamp WMA (*Bradford*) 28 Dec (D. Cimbaro).

Le Conte's Sparrow: 3 near the Alafia River (*Hillsborough*) 19 Dec (R. Paul); 1 at HPM 21 Dec (J. Krummrich); at least 6 at Tangerine 22 Dec ff (B. Anderson et al.); 1 at Lake City 24 Dec (J. Krummrich); 1 at Talbot Island SP 26 Dec (M. Dolan); 1 at PPSP 1 Jan (J. Hintermister, M. Manetz et al.); 1 at LARA 18 Jan (H. Robinson); 5 at FWBSTF 29 Jan (B. Bremser et al.).

Fox Sparrow: 2 at PPSP 4 Dec-1 Jan (J. Hintermister et al.); 1 at Genoa 18 Dec (J. Krummrich).

Song Sparrow: 1 at Boyd Hill Nature Park 18 Dec (R. Smith et al.); 2 at Brooker Creek Preserve 26 Dec (A. and R. Smith); 1 at Lake Louisa SP 7 Feb (T. Palmer); 3 wintered at LARA (H. Robinson).

LINCOLN'S SPARROW: 2 at Tall Timbers Research Station 12 Dec (D. Wassmer, L. Saul); 1 at HPM 18 Dec (G. McDermott); 1 at PPSP 11 Jan (R. Webb et al.) and 11-19 Feb (A. Kratter, R. Rowan); 3 wintered at LARA (H. Robinson).

SWAMP SPARROW: 70 wintered at LARA (H. Robinson).

WHITE-CROWNED SPARROW: 12 at Talbot Island SP 26 Dec-30 Jan (Roger Clark); 1 immature at Brooker Creek Preserve 26 Dec (A. and R. Smith); 6 in E *Polk* 26 Feb (L. Albright).

DARK-EYED JUNCO: 1 at Lake Talquin 11 Dec (D. Harder); 1 W of Apalachicola (*Franklin*) 22 Dec (J. Dozier); 3 wintered in *Alachua* (D. Beatty, E. Perry, M. Manetz).

BLUE GROSBEAK: 3 wintered at LARA (H. Robinson).

INDIGO BUNTING: 2 in female plumage at Seven Springs 30 Dec (E. Haney); 1 male at Lutz (*Pasco*) 18 Feb (D. Bowman); 3 wintered at LARA (H. Robinson).

PAINTED BUNTING: 1 female S of Fellsmere (*Indian River*) 4 Jan (S. Rowe); 2 at Tampa (*Hillsborough*) to 2 Feb (K. Allen et al.); 2 at Hague Dairy 19 Feb-EOS (B. Roberts, M. Manetz); 10 wintered at various sites in *Polk* (*fide* L. Cooper); 3 wintered at LARA (H. Robinson).

DICKCISSEL: 1 in N *Hillsborough* 18 Feb (S. Backes).

RED-WINGED BLACKBIRD: 1 partial albino male at New Port Richey 14-17 Jan (K. Tracey, photos to FOC).

YELLOW-HEADED BLACKBIRD: 1 male at Ponce De Leon Park (*Charlotte*) 3-4 Dec (J. Bouton, F. Frazier); 1 at LARA 11 Dec (H. Robinson); 1 at E Lake Tohopekaliga (*Osceola*) 18 Dec (Ruth Clark); 1 female at Port Richey (*Pasco*) 30 Dec (P. Young); 1 at PPSP 7 Jan (M. Meisenburg); 1 male at the *Hernando* landfill 17 Jan (M. Gardler); 1 female near Corkscrew Swamp Sanctuary 19 Jan (B. Jones).

RUSTY BLACKBIRD: 58 at PPSP 12 Dec-19 Feb (J. Hintermister, A. Kratter); 20 at Black Swamp 15 Dec-26 Feb (G. Menk et al.); 12 at Micanopy 17 Dec-EOS (C. Lanciani, G. Kiltie et al.); 2 at Alafaya STF 8 Jan (C. Pierce).

BREWER'S BLACKBIRD: 5 at Tram Road STF 10 Dec and 1 there 28 Jan (G. Menk et al.); 1 at Clearwater (*Pinellas*) 26 Dec (D. Goodwin, E. Haney et al.).

SHINY COWBIRD: 1 adult male at Eglin Air Force Base (*Okaloosa*) 20 Dec (B. Duncan, L. Wright); 1 singing male near LARA 11-19 Feb (K. Radamaker, C. Pierce); 4 wintered at Briggs Nature Center (*Lee*) (H. McGuinness et al.).

BRONZED COWBIRD: 1 at Punta Gorda 8-12 Dec (T. Elliott et al.); 1 male at New Port Richey 14 Jan (K. Tracey, photo to FOC); 5 at the Naples Landfill (*Collier*) 14-15 Feb (T. Doyle, D. Suitor); **21** wintered at Lakeland (*Polk*) (B. and L. Cooper et al.).

ORCHARD ORIOLE: 1 wintered at LARA (J. Bouton, B. Ahern, E. Scales, H. Robinson).

BALTIMORE ORIOLE: 1 male at St. Leo 5 Dec (A. and R. Smith); 1 female at New Port Richey 18 Jan (K. Tracey et al.); 2 males at Lutz (*Pasco*) 29 Feb (D. Bowman); 8 wintered at Lake Region Village (*Polk*) (B. and L. Cooper); 5 wintered at LARA (H. Robinson).

HOUSE FINCH: 1 female E of Dade City 21 Dec (A. and R. Smith, B. Ahern et al.); 4 at Haines City (*Polk*) 15 Feb (A. and H. Wheaton).

PINE SISKIN: 1 at Cedar Key 1 Feb (D. Henderson).

HOUSE SPARROW: 2 at LARA 6 Feb, and 1 there 23 Feb (both H. Robinson).

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RECORDS COMMITTEE REPORT

Thirteenth Report of the Florida Ornithological Society Records Committee: 1996, 1997, 1998, 1999, and 2000.—The Florida Ornithological Society Records Committee (FOSRC) critically reviews all written sight reports and specimens and/or photographic records (including audio recordings) submitted to it to determine the validity of the reports. The Committee's findings are published periodically in the *Florida Field Naturalist (FFN)*. Of the 65 reports received and logged in 1996 through June 2000, 6 were not reviewed for various reasons discussed subsequently, 1 was withdrawn, and 4 are still under consideration: Cassin's Kingbird, *Tyrannus vociferans* (97-375); Thayer's Gull, *Larus thayeri* (99-389); Tropical Kingbird, *Tyrannus melancholicus* (00-402); and Black-headed Gull, *Larus ridibundus* (00-410). The committee considered 7 reports submitted prior to 1996. Of these, 1 was not reviewed. Thus of the 60 reports resolved, 36 (60%) were accepted and 24 (40%) were not accepted.

Since 1996, 13 species were added to the official FOSRC list of accepted Florida species. In addition, Rufous-sided Towhee was split into Eastern Towhee and Spotted Towhee, both verified from Florida, and Sharp-tailed Sparrow was split into Nelson's Sharp-tailed Sparrow and Saltmarsh Sharp-tailed Sparrow, also both verified from Florida, bringing the total to 480 species (see R&W 1992, *FFN* 23:38-43, *FFN* 24:122-134) (Appendix 1). Since the publication of Robertson and Woolfenden (1992), hereafter referred to as (R&W 1992), a total of 19 species have been added to the official FOSRC state list: Rough-legged Hawk, *Buteo lagopus* (00-415); Northern Lapwing, *Vanellus vanellus* (99-401); South Polar Skua, *Stercorarius maccormicki* (*FFN* 23:38-43); Gray-hooded Gull, *Larus cirrocephalus* (99-396); California Gull, *Larus californicus* (99-392); Thick-billed Murre, *Uria lomvia* (00-419); White-tipped Dove, *Leptotila verreauxi* (95-337); Snowy Owl, *Nyctea scandiaca* (00-406); Vaux's Swift, *Chaetura vauxi* (*FFN* 24:122-134); Broad-tailed Hummingbird, *Selasphorus platycercus* (00-409); Allen's Hummingbird, *Selasphorus sasin* (97-380); Western Wood-Pewee, *Contopus sordidulus* (*FFN* 24:122-134); Cuban Pewee, *Contopus caribaeus* (*FFN* 24:122-134); Sulphur-bellied Flycatcher, *Myiodynastes luteiventris* (96-362); Tropical Kingbird, *Tyrannus melancholicus* (00-416); MacGillivray's Warbler, *Oporornis tolmiei* (98-385); and American Tree Sparrow, *Spizella arborea* (98-386) and the two taxonomic splits mentioned above.

In 1998, with the adoption of new and more comprehensive Rules and Procedures (*cf.* the FOS' web page at <http://www.flmnh.ufl.edu/fos/>), the FOSRC may add species to its official state list without verifiable evidence, providing it so annotates them. However, since the new rules were adopted, no reports of species new to the state list submitted without verifiable evidence have satisfied the Committee's criteria for acceptance. Thus, all 480 species currently on the FOSRC state list are independently verifiable.

FOSRC members who evaluated these reports and their expiration date of tenure are as follows: Bruce H. Anderson (1996), Lyn S. Atherton (2003), Reed Bowman (2005), Robert A. Duncan (2004), R. Todd Engstrom (2002), Jon Greenlaw (2006), Wayne Hoffman (1998), Brian Hope (1999), Vaughn W. Morrison (1997), William B. Robertson, Jr. (deceased 2000), P. William Smith (resigned 1998), Mickey C. Wheeler (2001), and Glen E. Woolfenden (2000).

In this report is a list of species known to occur in Florida that the Committee has deemed sufficiently rare or difficult to identify to suggest FOSRC evaluation. Any species included on this list should be documented by the observer. All observers are encouraged to submit these reports to the FOSRC, including those intended for publication in the *Florida Field Naturalist* or any other publication.

While in the field, the observer should record a detailed description of all body parts (e.g., bill, legs, and feet, noting size, shape, and colors). Although a specimen or photograph

and vocal recordings are preferred, a sketch of the bird and vocal descriptions are beneficial. Behavioral traits and the habitat should be detailed. It is necessary to describe how all similar species were eliminated (e.g., similar members within a genus), not only those known or suspected to occur in Florida, but also any species that could possibly stray here or possibly escape from captivity. All observations should be submitted on the standard report form available from the Secretary or on the FOS' web page at <http://www.flmnh.ufl.edu/fos/>. In addition to uniformity, the report form provides the Committee and the observer with guidelines to those factors used by the FOSRC for its evaluation. Completed forms with supporting material should be submitted to the FOSRC Secretary.

Since 1994, the Committee has consisted of 7 members. Since adoption of the current FOSRC Rules and Procedures in 1998, an accepted report requires 7 accepting votes; or, 6 accepting votes and either 1 non-accept or abstain; or 5 accepts and 2 abstains. However, a report remains in circulation until it either is accepted, or it receives 7 non-accepting votes; or, 6 non-accepting votes and either 1 accept or abstain; or 5 non-accepts and 2 abstains. Prior to 1998, a unanimous vote was required to accept a report. The Committee adopted the "Verified Species" listed in *Florida bird species: an annotated list* (R&W 1992) as its baseline scientific list of Florida's avifauna ("State List"). When a report is accepted for a species new to the state, it is added to the official FOSRC state list, only when its natural occurrence is probable. If supporting specimens, photographs, or audio recordings exist it is considered verifiable; otherwise it is annotated as unverifiable. When a report is not accepted, it does not necessarily mean that a species was not correctly identified. Sometimes a sighting is too brief or the written account lacks sufficient detail to eliminate all possibilities. The Committee will reconsider a report if additional information is submitted that might alter a previous decision. All supporting documentation is deposited in the FOS Archives at the Florida Museum of Natural History, Gainesville.

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Accepted Reports
(in currently recognized phylogenetic sequence [AOU 1998, 2000])

Yellow-nosed Albatross, *Thalassarche chlororhynchos* (RP, 00-420): Photograph and description of a bird observed approximately 1 May 2000, 30 miles west of Tarpon Springs, Pinellas Co. Two previous records from Florida: a photograph (TTRS P 416-420) of a bird seen 3 July 1983 off St. Marks light, Wakulla Co. and a specimen (Archbold Biological Station GEW 5866) collected 27 May 1992 in Key Largo, Monroe Co. Considered a verified species by R&W (1992). Reports previously accepted by FOSRC: 95-326 (genus only); not accepted: none.

MANX SHEARWATER, *Puffinus puffinus* (RAD, 97-374): Photograph and description of a bird found 19 July 1997 at Pensacola Beach, Escambia Co., during Hurricane Danny. The bird was taken to a local veterinarian, photographed, and eventually released. Several specimens exist of this species from Florida, including the Gulf coast and Escambia Co. Reports previously accepted by FOSRC: 94-322; not accepted: none.

RED-BILLED TROPICBIRD, *Phaethon aethereus* (BD, 96-368): Description of a bird observed 29 June 1996 at Soldier Key, Biscayne National Park, Dade Co. Many reports (*ca.* 10-12) of this species along Atlantic, particularly northeast, coast (R&W 1992). Two previous records: Ponte Vedra Beach, St. Johns Co., October 1975, and Hutchinson Island, Martin Co., September 1979. Not previously reviewed by FOSRC.

ROSS'S GOOSE, *Chen rossii* (DBM, 99-399): Description and photograph of a bird observed 16 November-28 December 1996 at Apalachicola, Franklin Co. Many reports of this species, often individuals seen in flocks of *C. caerulescens*. Two previously published photographs (R&W 1992). Reports previously accepted by FOSRC: 88-133, 92-252; not accepted: none.

ROUGH-LEGGED HAWK, *Buteo lagopus* (KCR, 00-415, 00-417, 00-418): Description and photographs of a light morph bird and two immature dark morph birds observed 16-26 February 2000 at Zellwood, Orange Co. Many (*ca.* 60) reports throughout the state, but considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: none; not accepted: 82-026, 88-139, 89-165, 91-245. Added to the official FOSRC state list as a verifiable species.

NORTHERN LAPWING, *Vanellus vanellus* (BP, 99-401): Description and photographs of a bird observed by numerous people 7 December 1997- 4 January 1998 along the eastern shore of Lake Istokpoga, about 6 miles east of Lake Placid, Highlands Co. One previous report in Palm Beach Co., but considered an unverified straggler by R&W (1992), although has occurred elsewhere along the Atlantic coast of North America. Not previously reviewed by FOSRC. Added to the official FOSRC state list as a verifiable species.

SHARP-TAILED SANDPIPER, *Calidris acuminata* (JEC, 96-354): Description of a bird observed 15 September 1995 near Tallahassee, Leon Co. One previous record, a bird collected in southern Dade Co. (R&W 1992). Not previously reviewed by FOSRC.

SOUTH POLAR SKUA, *Catharacta maccormicki* (LKM, 99-394; HLB, PRL, 99-395; JSG, MCW, 00-414): Photographs and descriptions of three birds that appeared along the Atlantic Coast during the Fall of 1998. An intermediate morph bird (99-394) observed 9 November 1998 near New Smyrna Beach, Volusia Co. Another intermediate morph (99-395) was observed 7-10 October 1998 near Ft. Clinch State Park, Nassau Co. This bird was eventually captured and taken to a local wildlife rehabilitator, then released 18 October at Ft. Clinch. A dark morph bird (00-414) was observed 4-12 December 1998 near Boynton Beach Inlet, Palm Beach Co. *Ca.* 10 reports from Florida but considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: 82-024, 94-319 (genus only); not accepted: 83-030, 83-056. Annotated on official FOSRC state list as a verifiable species.

BLACK-HEADED GULL, *Larus ridibundus* (RC, 99-400): Photographs and description of a first winter bird observed 26-27 December 1998 at Black Hammock Island, near Jacksonville, Duval Co. Irregular winter visitor (*ca.* 15 reports) (R&W 1992). Reports previously accepted by FOSRC: 82-021; not accepted: none.

GRAY-HOODED GULL, *Larus cirrocephalus* (DBM, 99-396): Photographs and description of an adult bird in breeding (alternate) plumage observed 26 December 1998 at the boat landing for St. Vincent NWR at Apalachicola, Franklin Co. Represents first photographic record for North America. Not previously reviewed by FOSRC. Added to the official FOSRC state list as a verifiable species.

CALIFORNIA GULL, *Larus californicus* (DBM, 99-392): Photographs and description of a first winter bird observed 26 September 1998 at Apalachicola, Franklin Co., as Hurricane Georges approached the Gulf coast. Previously identified in 1978 and 1979, but photographs thought by some to be aberrant dark-eyed Herring Gull (*L. argentatus*).

Considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: 83-040; not accepted: 88-130, 89-182. Added to the official FOSRC state list as a verifiable species.

Thick-billed Murre, *Uria lomvia* (HEW, GEW, 00-419): Published account with photograph (*FFN* 26:139-140) of a bird observed 6 December 1992 on Hobe Sound Highway, Palm Beach Co. The bird was brought to a wildlife hospital where it subsequently died. The specimen was an emaciated female, subsequently prepared as a skin and housed in the collection at Archbold Biological Station (GEW 5872). Several reports of this species from Florida exist, but no previous verifiable records. Considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: none; not accepted: 83-027. Added to the official FOSRC state list as a verifiable species.

Zenaida Dove, *Zenaida aurita* (WH, PWS, 97-379): Description of an adult observed 15 and 21 February 1996 at Windley Key Quarry, Monroe Co. Although Audubon (*in* Howell 1932) reported them to nest commonly "in the islands near Indian Key," no modern specimens of this species exist (R&W 1992). Several published photographs exist: Plantation Key, Monroe Co., Dec. 1962 and upper Key Largo, Monroe Co., June 1988 (*FFN* 17:67-69) (R&W 1992). Reports previously accepted by FOSRC: none; not accepted: 82-018, 83-035, 88-141.

White-tipped Dove, *Leptotila verreauxi* (KTK, 95-337): Photograph and description of a bird observed 6-7 April 1995 at Garden Key, Dry Tortugas, Monroe Co. After extensive review determined characteristics consistent with *L. v. fulviventris*, the subspecies of southeastern Mexico and Yucatan. No previous reports from Florida and not previously reviewed by FOSRC. Added to the official FOSRC state list as a verifiable species.

Snowy Owl, *Nyctea scandiaca* (JEC, GW, 00-406): Photograph and description of an immature male observed 8-11 December 1999 at St. George Island, Franklin Co. Feathers appeared unworn reducing probability of an escaped captive. Two previous reports during years (1950, 1975) when major flights occurred farther north. Considered an unverified straggler by R&W (1992). Not previously reviewed by FOSRC. Added to the official FOSRC state list as a verifiable species.

Vaux's Swift, *Chaetura vauxi* (DBM, 99-397): Published report (*Alabama Birdlife* 44:20-21) of two adult birds roosting in a chimney at Apalachicola, Franklin Co., one of which was banded, measured, and released. Previously published reports of this species in Florida, based on recordings of vocalizations and photographs, include once in Gainesville, Alachua, Co. (*FFN* 23:25-29), and twice previously in Apalachicola (*FFN* 25:54-57). Several previous reports of birds wintering in the panhandle (R&W 1992). Reports previously accepted by FOSRC: 95-331; not accepted: 90-184.

Broad-tailed Hummingbird, *Selasphorus platycercus* (GW, 00-409): Specimen, photographs, and description of an immature male observed at a backyard feeder 18 January to 2 February 2000 at Crawfordsville, Wakulla Co. Bird subsequently died during banding. Specimen in collection at Archbold Biological Station (GEW 5945). Reports previously accepted by FOSRC: none; not accepted: 96-358. Added to the official FOSRC state list as a verifiable species.

Allen's Hummingbird, *Selasphorus sasin* (BMS, BR, 97-380): Photographs and description of a second-year male banded, measured, and tail feathers collected 30 January 1997 at a backyard feeder in Gainesville, Alachua Co. Unreported before the mid-1980's, several reports since then, including published photographs: Cedar Key, Levy Co. (*American Birds* 42:371) (R&W 1992). The FOSRC concluded that measurements of the widths of rectrices is necessary to identify extralimital Rufous/Allen's hummingbirds (McKenzie and Robbins 1999). Previous reports of all green-backed hummingbirds were likely Allen's but were not accepted without tail measurements. Considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: none; not accepted: 88-138, 99-390. Added to the official FOSRC state list as a verifiable species.

CALLIOPE HUMMINGBIRD, *Stellula calliope* (BLC, 96-363): Photographs and description of an adult male observed 31 March 1996 at a backyard feeder in Lakeland, Polk Co. One previous record of a hatching-year female banded, photographed, measured and three tail feathers collected 18 December 1989 at Fort Walton Beach, Okaloosa Co. (R&W 1992). One report near Tallahassee. Reports previously accepted by FOSRC: 90-192; not accepted: none.

SAY'S PHOEBE, *Sayornis saya* (RR, 98-382): Photographs and description of a bird observed 19 January 1998 near Genoa, Hamilton Co. About nine reports, most along Gulf coast in fall (R&W 1992). One previously published photograph near Apopka, Orange Co., November 1975 (*American Birds* 30:57) (R&W 1992). Reports previously accepted by FOSRC: 88-158; not accepted: none.

CASSIN'S KINGBIRD, *Tyrannus vociferans* (KCR, 00-407): Photographs and description of a bird observed 5 December 1999 near Hopper Farms, Apopka, Orange Co. One previous record: photographs and audio recording of an individual near Loxahatchee NWR, December 1988 (R&W 1992). Reports previously accepted by FOSRC: 85-074, 92-255; not accepted: none.

TROPICAL KINGBIRD, *Tyrannus melancholicus* (MCW, 00-416): Video and audio recording of vocalization and description of an adult in fresh plumage observed 18 October 1999 near Coral Gables, Dade Co. Prior to splitting *T. couchi* from *T. melancholicus* (AOU 1983), all reports were referred as to *T. melancholicus* (R&W 1992). Considered an unverified straggler by R&W (1992). Not previously reviewed by the FOSRC. Added to the official FOSRC state list as a verifiable species.

SULPHUR-BELLIED FLYCATCHER, *Myiodynastes luteiventris* (MCW, 96-362): Photographs and video of a bird observed 14 October 1995 at Matheson Hammock County Park, Coral Gables, Dade Co. Two previous reports: southwestern Florida Bay, October 1960 and St. Marks NWR, October 1991, both identified only to genus, but possibly this species. Considered an unverified straggler by R&W (1992). Not previously reviewed by FOSRC. Added to the official FOSRC state list as a verifiable species.

THICK-BILLED VIREO, *Vireo crassirostris* (WG, 96-355): Audio recording and description of a bird observed 24 April 1995 near Ft. Lauderdale, Broward Co. Species thoroughly documented in Florida with audio recordings and photographs (Stevenson and Anderson 1994). Reports previously accepted by FOSRC: 89-179, 90-202, 91-226, 94-308; not accepted: 88-151, 93-279.

NORTHERN WHEATEAR, *Oenanthe oenanthe* (MB, 97-372): Description of a first-winter bird observed on 13 October 1996 on Big Pine Key, Monroe Co. Seven reports, of which several records predate FOSRC: specimen near Corkscrew Swamp, Collier Co., November 1955, photograph, Cape San Blas, Gulf Co., Sept. 1976. Reports previously accepted by FOSRC: 94-316; not accepted: 81-003, 82-020.

VARIED THRUSH, *Ixoreus naevius* (WY, 96-371): Photographs and description of an adult male observed 1 November 1996 at Honeymoon Island State Recreation Area, Pinellas Co. Two previous records from the Panhandle and a record from the southeastern coast (R&W 1992). Reports previously accepted by the FOSRC: 85-076, 88-132; not accepted: none.

KIRTLAND'S WARBLER, *Dendroica kirtlandii* (KCR, 00-403): Photographs and description of a bird observed 16 October 1999 at New Smyrna Dunes Park, New Smyrna Beach, Volusia Co. *Ca.* 15 reports scattered throughout state, except Keys (R&W 1992). One specimen from late 1800's in Palm Beach Co. (FMNH 20515 *in* R&W 1992). Reports previously accepted by the FOSRC: 82-025, 93-273; not accepted: 82-015, 89-176, 97-376 (see below).

MACGILLIVRAY'S WARBLER, *Oporornis tolmiei* (JSG, DLS, 98-385): Photograph, audio recording, and description of an adult male in breeding plumage observed 8-16 April 1998 near the Sanibel lighthouse, Lee Co. Two reports of *Oporornis* suggest this species, but

considered an unverified straggler by R&W (1992). Not previously reviewed by FOSRC. Added to the official FOSRC state list as a verifiable species.

American Tree Sparrow, *Spizella arborea* (RJB, 98-386): Photographs and description of an adult bird observed 15 April 1998 at St. Marks NWR, Wakulla Co. Several reports, no previous records. Considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: none; not accepted: 83-037. Added to the official FOSRC state list as a verifiable species.

Harris's Sparrow, *Zonotrichia querula* (RAD, 97-378): Description of an adult bird in winter plumage observed 16 December 1997 at the county yard waste dump at Ft. Walton Beach, Okaloosa Co. Many reports (*ca.* 11) and several published photographs (R&W 1992). Report of a bird February 1994 in Alachua Co., not reviewed for lack of documentation. Reports previously accepted by FOSRC: 94-315; not accepted: none.

Chestnut-collared Longspur, *Calcarius ornatus* (OB, 89-181; DH, 00-404): Reevaluation of a previously considered report (89-181). Photographs and description of a bird observed 24 November 1983 near Pa Hay Okee, Everglades National Park, Dade Co. Photographs confirmed essential field marks. Second record included photograph and description (00-404) of fall immature bird observed 31 October 1999 at Ft. Pickens, Escambia Co. Only two previous reports (one with a specimen) from Tallahassee. Reports previously accepted by FOSRC: none; not accepted: 89-181 (here reevaluated).

Reports Not Accepted

Red-necked Grebe, *Podiceps griseus* (96-370): Description of an adult bird observed 3 January 1981 at Martin County Park and Fish Beach, Martin Co. insufficient to confirm identification. No previous photographs, specimens, or otherwise verified reports of this species exist from Florida (R&W 1992). However, listed as having occurred in Florida in other references (Howell 1932), but without details regarding evidence. Considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: none; not accepted: none.

Great White Pelican, *Pelecanus onocrotalus* (98-383): Description of a bird resting on a sand spit in a phosphate pit near Bradley Junction, Polk Co. insufficient to confirm identification and origin uncertain. No previous photographs, specimens, or verified reports of this species exist from Florida. Reports previously accepted by FOSRC: none; not accepted: none.

Scarlet Ibis, *Eudocimus ruber* (94-299): Report of a bird that first appeared in February 1988 on Lower Matecumbe Key, Monroe Co., in immature plumage. The bird remained in this area for several years, eventually attaining adult plumage. The identity of this bird was unchallenged (photographs and description provided), but origin uncertain. Scarlet Ibis were raised at Disneyworld in 1987, but the exact number and the possibility of escapes are unknown. Escapes and previous introductions make natural status uncertain. Several specimens purportedly taken in Florida during the late 1800's. Considered a verified species in R&W (1992), but they add "perhaps more correctly assigned to Appendix B (probably unestablished exotics) or C (unestablished exotics)." Reports previously accepted by FOSRC: none; not accepted: 94-306.

White-cheeked Pintail, *Anas bahamensis* (96-367): Multiple reports of an adult male bird observed throughout spring, summer, and fall 1996 at Merritt Island NWR, Brevard Co. The identity of this bird was unchallenged (detailed description provided), but origin uncertain. The bird appeared paler than usual, suggesting an avicultural origin. Considered an occasional to irregular visitor to Florida (multiple specimens and published photographs). Listed as a verified species in R&W (1992), but a common bird in waterfowl collections and some reports traced to known escapes (R&W 1992). Reports previously accepted by FOSRC: 90-201; not accepted: none.

FERRUGINOUS HAWK, *Buteo regalis* (96-369): Two reports (photographs and descriptions) of an immature bird observed late March-early April 1996 near the municipal water treatment pools, Tallahassee, Leon Co. Photographs could not eliminate Krider's Red-tailed Hawk. Very rare and irregular winter visitor (*ca.* 5 accepted reports [not all reviewed by FOSRC], one published photograph). Listed as a verified species in R&W (1992). Reports previously accepted by FOSRC: 84-059, 86-093; not accepted: 85-072, 87-127, 87-128, 88-135, 88-150, 93-278.

LITTLE STINT, *Calidris minuta* (98-388): Photographs and description of a bird observed 5 November 1998 at Naples Beach, Collier Co. Bird roosting in a group of *Calidris alba*. Plumage appeared different, but photographs suggested that the bird had three toes and *C. alba* is only *Calidris* species with three toes. No previous photographs, specimens, or verified reports of this species exist from Florida (R&W 1992). Reports previously accepted by FOSRC: none; not accepted: 85-085.

CALIFORNIA GULL, *Larus californicus* (00-408): Photographs and description of a first-winter bird observed 11-14 December 1999 near East Point, Franklin Co. insufficient to distinguish from first-winter *L. argentatus* with pale, bicolor bill. Reports previously accepted by FOSRC: 83-040, 99-392 (see above); not accepted: 88-130, 89-182.

KELP GULL, *Larus dominicanus* (96-361): Description of a third-winter bird observed 23 December 1995 at Ft. Pickens State Park, Santa Rosa Co. insufficient to confirm identification. No previous photographs, specimens, or verified reports of this species exist from Florida. Reports previously accepted by FOSRC: none; not accepted: none.

ICELAND GULL, *Larus glaucoides* (98-384): Description of a first-year winter bird observed at Ft. Clinch State Park fishing pier, Nassau Co. insufficient to distinguish from first-year winter plumage of several other species. Many reports (*ca.* 35 reports [most not evaluated by FOSRC], 1 specimen, several published photographs), but confusion may exist with similar *L. thayeri* or *L. hyperboreus* (R&W 1992). Listed as a verified species by R&W (1992). Reports previously accepted by FOSRC: 93-270; not accepted: 93-277.

NORTHERN SAW-WHET OWL, *Aegolius acadicus* (97-373): Description of a vocalizing bird 19 February 1997 at Indian Lake Estates, Polk Co. insufficient to confirm identification. Saw-whet Owls on wintering grounds do not normally occupy cavities and are usually silent, contra this bird. Casual fall-winter visitor, particularly to northeastern Florida (R&W 1992). Listed as a verified species by R&W (1992); two specimens. Reports previously accepted by FOSRC: none; not accepted: none.

COMMON POORWILL, *Phalaenoptilus nuttallii* (95-336): Reevaluation of a previously considered report. Description of a bird observed May 1995 in the Dry Tortugas (*FFN* 24:16-17) insufficient to confirm identification. No previous photographs, specimens, or verified reports of this species exist from Florida. Reports previously accepted by FOSRC: none; not accepted: 95-336 (reevaluated here), 95-346.

WHITE-THROATED SWIFT, *Aeronautes saxatalis* (96-364): Description of a single bird in flight, 800-1000' overhead in a flock of Chimney Swifts (*Chaetura pelagica*), 11 May 1996 at Port Orange, Volusia Co., insufficient to confirm identification. No previous photographs, specimens, or verified reports of this species exist from Florida. Reports previously accepted by FOSRC: none; not accepted: none.

ALLEN'S HUMMINGBIRD, *Selasphorus sasin* (93-276, 99-390): Reevaluation of a previously considered report (93-276) because tail feathers purportedly available. However, tail feathers lost and without tail measurements, previous decision of "not accepted" stands. Second report a description of an adult male observed at a backyard feeder 5 January 1998 at Tallahassee, Leon Co. Unreported before the mid-1980's, several reports since then, including published photos: Cedar Key, Levy Co. (*American Birds* 42:371) (R&W 1992). The FOSRC concluded that measurements of the widths of rectrices is necessary to distinguish extralimital Rufous/Allen's hummingbirds (McKenzie and Robbins 1999). Previous reports of all green-backed hummingbirds were

likely Allen's but were not accepted without tail measurements. Considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: 97-380 (see above); not accepted: 88-138, 93-276 (reevaluated here).

Broad-tailed Hummingbird, *Selasphorus platycercus* (96-358): Description and drawing of tail of a bird observed at a backyard feeder 9 January 1996 at Pensacola, Escambia Co. insufficient to confirm identification. No previous photographs, specimens, or verified reports of this species exist from Florida. Reports previously accepted by FOSRC: 00-409 (see above); not accepted: none.

Magnificent Hummingbird, *Eugenes fulgens* (96-359): Two reports, with photographs and descriptions of a female or immature male observed at a backyard feeder 22 December 1995 at Pace, Santa Rosa Co. Description inadequate to confirm identity and photographs could not eliminate Black-chinned Hummingbird. No previous photographs, specimens, or verified reports of this species exist from Florida. Reports previously accepted by FOSRC: none; not accepted: none.

Cuban Pewee, *Contopus caribaeus* (00-412): Photographs and description of a bird observed 13-14 May 1998 at Garden Key, Dry Tortugas, Monroe Co. insufficient to confirm identification. One report near Hypoluxo Island in 1984, but considered unverified straggler in R&W (1992), subsequently added to the official FOSRC state list (*FFN* 24:122-134). Reports previously accepted by FOSRC: 95-333; not accepted: none.

Myiodynastes flycatcher, *Myiodynastes* sp. (95-343): Description of a bird observed 25 September 1995 at St. George Island State Park, Franklin Co. Description insufficient to distinguish genus from other related genera. No previous photographs, specimens, or verified reports of *M. maculatus* exist from Florida, but two previous reports of *Myiodynastes* spp. (not reviewed by FOSRC) thought likely to be *M. luteiventris* (R&W 1992) and recent report of *M. luteiventris* with photographs and videos accepted by FOSRC (see above). Reports previously accepted by FOSRC: none; not accepted: none.

Brown-chested Martin, *Progne tapera* (91-248): Reevaluation of a previously considered report. Description of a possibly immature bird perched and preening on a wire and flying near Brown's Farm Wildlife Management Area, Palm Beach Co. This report was previously accepted by the FOSRC but under different criteria; because the bird was neither collected nor photographed, it was considered only hypothetical (*FFN* 23:40), a status no longer recognized by the FOSRC. Upon reconsideration, the FOSRC decided the original field notes were insufficient to confirm identity. No photographs or specimens of this species exist from Florida and considered an unverified straggler by R&W (1992). Reports previously accepted by FOSRC: 91-248 (reconsidered, not accepted); not accepted: none.

Kirtland's Warbler, *Dendroica kirtlandii* (97-376): Description of a bird observed 20 October 1997, 3 miles south of Sebastian Inlet, Indian River Co. Observation so brief that field marks and behavior noted could not eliminate similar species. Sporadic to occasional transient, perhaps wandering migrants (R&W 1992). Many fall and spring reports (not all evaluated) and one specimen. Listed as a verified species by R&W (1992). Reports previously accepted by FOSRC: 82-025, 93-273, 00-403 (see above); not accepted: 82-015, 89-176.

Bahama Yellowthroat, *Geothlypis rostrata* (00-411): Description of a bird observed 29 April 2000 1 mile south of Mahogany Hammock, Everglades National Park, Dade Co. insufficient to confirm identification. Only two previous reports in Florida, considered an unverified straggler by R&W (1992). Not previously reviewed by FOSRC.

Harris's Sparrow, *Zonotrichia querula* (97-381): Description of a first-year bird observed in a backyard 12-14 November 1997 at Niceville, Okaloosa Co. insufficient to confirm identity. Irregular winter visitor, often at backyard feeders (R&W 1992). Many reports and published photographs. Listed as a verified species by R&W (1992). Reports previously accepted by FOSRC: 94-315; not accepted: none.

COMMON REDPOLL, *Carduelis flammea* (00-413): Description of a bird observed on Garden Key, Dry Tortugas, Monroe Co. insufficient to confirm identity. Single report on a Jacksonville Christmas Bird Count in 1971 (R&W 1992). Considered an unverified straggler by R&W (1992). Not previously reviewed by the FOSRC.

TRI-COLORED MUNIA (FORMERLY CHESTNUT MANNIKIN), *Lonchura malacca* (99-398): Photographs and description of an adult bird observed 25-26 June 1999 within the walls of Ft. Jefferson on Garden Key, Dry Tortugas, Monroe Co. appeared to be *L. malacca*, but taxonomic status of this species unclear. Because the species has been introduced and established in Puerto Rico, possibly could have been a natural occurrence, but also a common captive bird in South Florida and the West Indies, thus the origin was considered uncertain. The bird had a long hallux nail, suggesting an avicultural origin. Previous report of successful breeding in Florida (*American Birds* 19:537), otherwise no previous photographs, specimens, or verified reports of this species exist from Florida (R&W 1992). Considered an unestablished exotic by R&W (1992). Reports previously accepted by FOSRC: none; not accepted: none.

REPORTS NOT EVALUATED

RED-FOOTED BOOBY, *Sula sula* (98-387): Photographs and description of a bird observed 21 April 1998 at Long Key, Dry Tortugas, Monroe Co. Very rare, irregular visitor during the summer and fall at the Dry Tortugas, multiple specimens and published photographs (R&W 1992). Listed as a verified species by R&W (1992), no longer on FOSRC review list. Reports previously accepted by FOSRC: 82-013, 95-344; not accepted: none.

WHITE-FACED IBIS, *Plegadis chihi* (94-312b): Previously split from report 94-312a because of assertions that multiple birds may have been involved. No detailed description, but observation reported second hand to FOSRC members. Report had remained open pending receipt of more detailed descriptions and a video that had reportedly been taken of the bird. These were never received and the report was withdrawn. A rare, sporadic visitor, several specimens, including a female collected with eggs and nest in Brevard Co., and several published photographs (R&W 1992). Listed as a verified species in R&W (1992). Reports previously accepted by FOSRC: 94-312a; not accepted: none.

KEY WEST QUAIL-DOVE, *Geotrygon chrysia* (99-391, 99-393 and other reports not catalogued): Multiple reports received, photographs and descriptions of birds observed during April 1999 at Bear Lake Trail, Everglades National Park, Dade Co.; Bill Baggs State Recreation Area, Miami, Dade, Co.; and Birch State Park, Ft. Lauderdale, Broward Co. A rare, sporadic straggler to the Keys, one specimen and multiple published photographs (R&W 1992). Listed as a verified species by R&W (1992), no longer on FOSRC review list. Reports previously accepted by FOSRC: 87-114, 90-207, 91-246, 92-258; not accepted: none.

ANNA'S HUMMINGBIRD, *Calypte anna* (96-360): Photograph and description of a bird observed at a backyard feeder 14 May 1995 at Tallahassee, Leon Co. Withdrawn. Known in Florida from one record, an individual photographed and videotaped at a feeder 17 January-8 March 1998 at Tallahassee, Leon Co. (*American Birds* 42:425). Listed as a verified species by R&W (1992). Reports previously accepted by FOSRC: 88-154; not accepted: none.

ASH-THROATED FLYCATCHER, *Myiarchus cinerescens* (00-405): Description of a bird observed 10 November 1999 at the Black Swamp, southwest of Tallahassee, Leon Co. Listed as a verified species by R&W (1992), no longer on FOSRC review list. Reports previously accepted by FOSRC: 83-051, 90-186, 94-287, 94-289, 94-314, 94-324, 94-325; not accepted: 90-187, 94-284.

WARBLING VIREO, *Vireo gilvus* (96-365, 366a, 366b): Multiple reports received, descriptions of birds observed March-April 1996 at Ft. Walton Beach, Okaloosa Co., and Key

West, Monroe Co. Considered rare, irregular spring and fall transient (R&W 1992). Commonly reported, but only two specimens from Florida (Stevenson and Anderson 1994). Listed as a verified species by R&W (1992), no longer on FOSRC review list. Reports previously accepted by FOSRC: 88-156; not accepted: 95-335.

Taxonomic Revisions

The FOSRC follows the American Ornithologists' Union in all matters of taxonomy and nomenclature. The AOU's Committee on Classification and Nomenclature periodically publishes taxonomic and nomenclatural revisions to its *Check-list of North American Birds*. The FOSRC shall initiate a review of any species-level taxa that should be added to or deleted from the official FOSRC state list as a result of revisions to the AOU's *Check-list*. The following apply to Florida based on changes published by the AOU after publication of R&W (1992) up to and including American Ornithologists' Union (1998).

Gray-cheeked Thrush, *Catharus minimus* was split into *C. minimus* (Gray-cheeked Thrush) and *C. bicknelli* (Bicknell's Thrush) (AOU 1995), on the basis of differences in morphology, vocalizations, habitat preferences and migration patterns (Ouellet 1993). *C. minimus* is a regular fall and spring transient throughout Florida. The FOSRC voted to retain *C. minimus* on the official FOSRC state list. *C. bicknelli* winters in the Greater Antilles and is assumed to migrate through Florida. Specimens of both species have been reported collected in Florida, but none of the specimens in the collection at Archbold Biological Station appeared consistent with morphological and plumage characteristics of *C. bicknelli* based on data provided by Ouellet (1993). The FOSRC concluded that the status of *C. bicknelli* in Florida requires additional research before adding it to the official FOSRC state list.

Rufous-sided Towhee, *Pipilo erythrophthalmus* was split again into *P. erythrophthalmus* (Eastern Towhee) and *P. maculatus* (Spotted Towhee) (AOU 1995), on the basis of differences in dorsal plumage patterns, vocalizations, the degree of sexual dimorphism, assortative mating, and significant genetic divergence. *P. erythrophthalmus* is a common resident in Florida and the FOSRC voted to retain this species on the official FOSRC state list, noting the change in common name. *P. maculatus* is casual in eastern North America and the two species form a narrow hybrid zone in the central Great Plains. Review of the only Florida specimen of *P. maculatus* (TTRS 2955), a female collected by Henry M. Stevenson on 14 December 1967 near St. Theresa, Franklin Co., confirmed its identity. The FOSRC voted to add *P. maculatus* to the official FOSRC state list.

Sharp-tailed Sparrow, *Ammodramus caudacutus* was split into *A. caudacutus* (Saltmarsh Sharp- tailed Sparrow) and *A. nelsoni* (Nelson's Sharp-tailed Sparrow) (AOU 1995), on the basis of differences in morphology, vocalizations, and breeding habitat (Greenlaw 1993). Both species are common winter residents in Florida. Following examination of the morphological differences of several specimens (collection of Archbold Biological Station) of both species collected in Florida, the FOSRC voted to retain *A. caudacutus* on the official FOSRC state list, noting the change in common name, and to add *A. nelsoni* to the list.

Northern Oriole, *Icterus galbula* was split again into *I. galbula* (Baltimore Oriole), *I. bullockii* (Bullock's Oriole), and *I. abeillei* (Black-backed Oriole) (AOU 1995), reverting to their former English names, on the basis of differences in morphology, plumage, vocalizations, and a variety of other characteristics. Hybridization between all three species occurs, but the hybrid zone is stable with little introgression (Corbin and Sibley 1977, Rising 1983). *I. galbula* is a regular transient and an uncommon winter visitor to Florida. The FOSRC voted to retain *I. galbula* on the official FOSRC state list, noting the change in common name. *I.bullockii* also is considered widespread and is

purported to make up a considerable part of the wintering population in northwestern Florida (Duncan 1988 *in* R&W 1992). Only two specimens identified as *I. bullockii* have been collected in Florida: UMRC 1437 (now in collections at Archbold), collected by D. R. Paulson on 24 December 1956, 3 miles east of Princeton, Dade Co., and TTRS 2443, collected by S. L. Olson on 17 October 1964 on Dog Island, Franklin Co. Review of these specimens found that neither was fully consistent with plumage characteristics of winter female or immature *I. bullockii* (Lee and Birch 1998), but were consistent with *I. galbula*. The FOSRC concluded that the status of *I. bullockii* in Florida requires additional research before adding it to the official FOSRC state list.

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Appendix 1.

Official State List of the Birds of Florida as Compiled by the Florida Ornithological Society Records Committee

A list of modern bird species definitely having occurred in Florida by natural appearance or by establishment of an exotic. The base list shall be the Supplement: Checklist of Florida Birds, pp. 255-260 in Robertson & Woolfenden (1992), as updated by final decisions of the Florida Ornithological Society's Records Committee. The list is updated through 3 June 2000. Established exotics (e); extinct native species (x) and disestablished exotics (d); and species listed without verifiable evidence (u) shall be so annotated. Sibling species groups may be included without reference to a particular underlying species but shall not be counted in any total of species found in Florida unless none of the underlying species are on the state list.

Species in the list below annotated with an * should be documented when detected in Florida and submitted to the FOSRC for review. In addition, documentation should be submitted to the FOSRC for any species detected in Florida, believed to have occurred naturally or to have escaped, but not appearing in the main list of the aforementioned publication.

GAVIIDAE	
Gavia stellata	Red-throated Loon
Gavia pacifica	Pacific Loon
Gavia immer	Common Loon
PODICIPEDIDAE	
Tachybaptus dominicus	Least Grebe*
Podilymbus podiceps	Pied-billed Grebe
Podiceps auritus	Horned Grebe
Podiceps nigricollis	Eared Grebe
Aechmophorus occidentalis	Western Grebe*
DIOMEDEIDAE	
Thalassarche chlororhynchos	Yellow-nosed Albatross*
PROCELLARIIDAE	
Pterodroma hasitata	Black-capped Petrel
Calonectris diomedea	Cory's Shearwater
Puffinus gravis	Greater Shearwater
Puffinus griseus	Sooty Shearwater
Puffinus puffinus	Manx Shearwater*
Puffinus lherminieri	Audubon's Shearwater
HYDROBATIDAE	
Oceanites oceanicus	Wilson's Storm-Petrel
Oceanodroma leucorhoa	Leach's Storm-Petrel
Oceanodroma castro	Band-rumped Storm-Petrel
PHAETHONTIDAE	
Phaethon lepturus	White-tailed Tropicbird
Phaethon aethereus	Red-billed Tropicbird*
SULIDAE	
Sula dactylatra	Masked Booby
Sula leucogaster	Brown Booby
Sula sula	Red-footed Booby
Morus bassanus	Northern Gannet

PELECANIDAE	
Pelecanus erythrorhynchos	American White Pelican
Pelecanus occidentalis	Brown Pelican
PHALACROCORACIDAE	
Phalacrocorax auritus	Double-crested Cormorant
Phalacrocorax carbo	Great Cormorant
ANHINGIDAE	
Anhinga anhinga	Anhinga
FREGATIDAE	
Fregata magnificens	Magnificent Frigatebird
ARDEIDAE	
Botaurus lentiginosus	American Bittern
Ixobrychus exilis	Least Bittern
Ardea herodias	Great Blue Heron
Ardea alba	Great Egret
Egretta thula	Snowy Egret
Egretta caerulea	Little Blue Heron
Egretta tricolor	Tricolored Heron
Egretta rufescens	Reddish Egret
Bubulcus ibis	Cattle Egret
Butorides virescens	Green Heron
Nycticorax nycticorax	Black-crowned Night-Heron
Nyctanassa violacea	Yellow-crowned Night-Heron
THRESKIORNITHIDAE	
Eudocimus albus	White Ibis
Eudocimus ruber	Scarlet Ibis*
Plegadis falcinellus	Glossy Ibis
Plegadis chihi	White-faced Ibis*
Ajaia ajaja	Roseate Spoonbill
CICONIIDAE	
Mycteria americana	Wood Stork
CATHARTIDAE	
Coragyps atratus	Black Vulture
Cathartes aura	Turkey Vulture
PHOENICOPTERIDAE	
Phoenicopterus ruber	Greater Flamingo
ANATIDAE	
Dendrocygna autumnalis	Black-bellied Whistling-Duck
Dendrocygna bicolor	Fulvous Whistling-Duck
Anser albifrons	Greater White-fronted Goose
Chen caerulescens	Snow Goose
Chen rossii	Ross's Goose*
Branta canadensis	Canada Goose
Branta bernicla	Brant
Cygnus columbianus	Tundra Swan
Cairina moschata	Muscovy Duck (e)
Aix sponsa	Wood Duck
Anas strepera	Gadwall

Anas penelope	Eurasian Wigeon
Anas americana	American Wigeon
Anas rubripes	American Black Duck
Anas platyrhynchos	Mallard
Anas fulvigula	Mottled Duck
Anas discors	Blue-winged Teal
Anas cyanoptera	Cinnamon Teal
Anas clypeata	Northern Shoveler
Anas bahamensis	White-cheeked Pintail*
Anas acuta	Northern Pintail
Anas crecca	Green-winged Teal
Aythya valisineria	Canvasback
Aythya americana	Redhead
Aythya collaris	Ring-necked Duck
Aythya marila	Greater Scaup
Aythya affinis	Lesser Scaup
Somateria spectabilis	King Eider*
Somateria mollissima	Common Eider
Histrionicus histrionicus	Harlequin Duck
Melanitta perspicillata	Surf Scoter
Melanitta fusca	White-winged Scoter
Melanitta nigra	Black Scoter
Clangula hyemalis	Long-tailed Duck (formerly Oldsquaw)
Bucephala albeola	Bufflehead
Bucephala clangula	Common Goldeneye
Lophodytes cucullatus	Hooded Merganser
Mergus merganser	Common Merganser*
Mergus serrator	Red-breasted Merganser
Nomonyx dominicus	Masked Duck*
Oxyura jamaicensis	Ruddy Duck
ACCIPITRIDAE	
Pandion haliaetus	Osprey
Elanoides forficatus	Swallow-tailed Kite
Elanus leucurus	White-tailed Kite
Rostrhamus sociabilis	Snail Kite
Ictinia mississippiensis	Mississippi Kite
Haliaeetus leucocephalus	Bald Eagle
Circus cyaneus	Northern Harrier
Accipiter striatus	Sharp-shinned Hawk
Accipiter cooperii	Cooper's Hawk
Accipiter gentilis	Northern Goshawk*
Buteo lineatus	Red-shouldered Hawk
Buteo platypterus	Broad-winged Hawk
Buteo brachyurus	Short-tailed Hawk
Buteo swainsoni	Swainson's Hawk
Buteo jamaicensis	Red-tailed Hawk
Buteo regalis	Ferruginous Hawk*
Buteo lagopus	Rough-legged Hawk*
Aquila chrysaetos	Golden Eagle
FALCONIDAE	
Caracara cheriway	Crested Caracara
Falco sparverius	American Kestrel

Falco columbarius	Merlin
Falco peregrinus	Peregrine Falcon
PHASIANIDAE	
Meleagris gallopavo	Wild Turkey
Colinus virginianus	Northern Bobwhite
RALLIDAE	
Coturnicops noveboracensis	Yellow Rail
Laterallus jamaicensis	Black Rail
Rallus longirostris	Clapper Rail
Rallus elegans	King Rail
Rallus limicola	Virginia Rail
Porzana carolina	Sora
Porphyrula martinica	Purple Gallinule
Gallinula chloropus	Common Moorhen
Fulica americana	American Coot
ARAMIDAE	
Aramus guarauna	Limpkin
GRUIDAE	
Grus canadensis	Sandhill Crane
Grus americana	Whooping Crane (x)
CHARADRIIDAE	
Vanellus vanellus	Northern Lapwing*
Pluvialis squatarola	Black-bellied Plover
Pluvialis dominica	American Golden-Plover
Charadrius alexandrinus	Snowy Plover
Charadrius wilsonia	Wilson's Plover
Charadrius semipalmatus	Semipalmated Plover
Charadrius melodus	Piping Plover
Charadrius vociferus	Killdeer
Charadrius montanus	Mountain Plover*
HAEMATOPODIDAE	
Haematopus palliatus	American Oystercatcher
RECURVIROSTRIDAE	
Himantopus mexicanus	Black-necked Stilt
Recurvirostra americana	American Avocet
SCOLOPACIDAE	
Tringa melanoleuca	Greater Yellowlegs
Tringa flavipes	Lesser Yellowlegs
Tringa solitaria	Solitary Sandpiper
Catoptrophorus semipalmatus	Willet
Actitis macularia	Spotted Sandpiper
Bartramia longicauda	Upland Sandpiper
Numenius phaeopus	Whimbrel
Numenius americanus	Long-billed Curlew
Limosa limosa	Black-tailed Godwit*
Limosa haemastica	Hudsonian Godwit
Limosa lapponica	Bar-tailed Godwit*
Limosa fedoa	Marbled Godwit
Arenaria interpres	Ruddy Turnstone

Aphriza virgata	Surfbird*
Calidris canutus	Red Knot
Calidris alba	Sanderling
Calidris pusilla	Semipalmated Sandpiper
Calidris mauri	Western Sandpiper
Calidris minutilla	Least Sandpiper
Calidris fuscicollis	White-rumped Sandpiper
Calidris bairdii	Baird's Sandpiper
Calidris melanotos	Pectoral Sandpiper
Calidris acuminata	Sharp-tailed Sandpiper*
Calidris maritima	Purple Sandpiper
Calidris alpina	Dunlin
Calidris ferruginea	Curlew Sandpiper
Calidris himantopus	Stilt Sandpiper
Tryngites subruficollis	Buff-breasted Sandpiper
Philomachus pugnax	Ruff
Limnodromus griseus	Short-billed Dowitcher
Limnodromus scolopaceus	Long-billed Dowitcher
Gallinago gallinago	Common Snipe
Scolopax minor	American Woodcock
Phalaropus tricolor	Wilson's Phalarope
Phalaropus lobatus	Red-necked Phalarope
Phalaropus fulicaria	Red Phalarope

LARIDAE

Stercorarius maccormicki	South Polar Skua*
Stercorarius pomarinus	Pomarine Jaeger
Stercorarius parasiticus	Parasitic Jaeger
Stercorarius longicaudus	Long-tailed Jaeger
Larus atricilla	Laughing Gull
Larus pipixcan	Franklin's Gull
Larus minutus	Little Gull*
Larus ridibundus	Black-headed Gull*
Larus cirrocephalus	Gray-hooded Gull*
Larus philadelphia	Bonaparte's Gull
Larus belcheri	Band-tailed Gull*
Larus delawarensis	Ring-billed Gull
Larus californicus	California Gull*
Larus argentatus	Herring Gull
Larus thayeri	Thayer's Gull*
Larus glaucoides	Iceland Gull*
Larus fuscus	Lesser Black-backed Gull
Larus hyperboreus	Glaucous Gull
Larus marinus	Great Black-backed Gull
Xema sabini	Sabine's Gull
Rissa tridactyla	Black-legged Kittiwake
Sterna nilotica	Gull-billed Tern
Sterna caspia	Caspian Tern
Sterna maxima	Royal Tern
Sterna sandvicensis	Sandwich Tern
Sterna dougallii	Roseate Tern
Sterna hirundo	Common Tern
Sterna paradisaea	Arctic Tern

Sterna forsteri	Forster's Tern
Sterna antillarum	Least Tern
Sterna anaethetus	Bridled Tern
Sterna fuscata	Sooty Tern
Chlidonias niger	Black Tern
Anous stolidus	Brown Noddy
Anous minutus	Black Noddy
Rynchops niger	Black Skimmer
ALCIDAE	
Alle alle	Dovekie
Uria lomvia	Thick-billed Murre*
Alca torda	Razorbill*
Brachyramphus perdix	Long-billed Murrelet*
Fratercula arctica	Atlantic Puffin*
COLUMBIDAE	
Columba livia	Rock Dove (e)
Columba squamosa	Scaly-naped Pigeon*
Columba leucocephala	White-crowned Pigeon
Columba fasciata	Band-tailed Pigeon*
Streptopelia turtur	European Turtle-Dove*
Streptopelia decaocto	Eurasian Collared-Dove (e)
Zenaida asiatica	White-winged Dove
Zenaida aurita	Zenaida Dove*
Zenaida macroura	Mourning Dove
Ectopistes migratorius	Passenger Pigeon (x)
Columbina passerina	Common Ground-Dove
Leptotila verreauxi	White-tipped Dove*
Geotrygon chrysia	Key West Quail-Dove
Geotrygon montana	Ruddy Quail-Dove*
PSITTACIDAE	
Melopsittacus undulatus	Budgerigar (e)
Myiopsitta monachus	Monk Parakeet (e)
Conuropsis carolinensis	Carolina Parakeet (x)
Brotogeris versicolurus	White-winged Parakeet (e)
CUCULIDAE	
Coccyzus erythropthalmus	Black-billed Cuckoo
Coccyzus americanus	Yellow-billed Cuckoo
Coccyzus minor	Mangrove Cuckoo
Crotophaga ani	Smooth-billed Ani
Crotophaga sulcirostris	Groove-billed Ani
TYTONIDAE	
Tyto alba	Barn Owl
Otus flammeolus	Flammulated Owl*
Otus asio	Eastern Screech-Owl
Bubo virginianus	Great Horned Owl
Nyctea scandiaca	Snowy Owl*
Athene cunicularia	Burrowing Owl
Strix varia	Barred Owl
Asio otus	Long-eared Owl*
Asio flammeus	Short-eared Owl
Aegolius acadicus	Northern Saw-whet Owl*

CAPRIMULGIDAE	
Chordeiles acutipennis	Lesser Nighthawk
Chordeiles minor	Common Nighthawk
Chordeiles gundlachii	Antillean Nighthawk
Caprimulgus carolinensis	Chuck-will's-widow
Caprimulgus vociferus	Whip-poor-will
APODIDAE	
Streptoprocne zonaris	White-collared Swift*
Chaetura pelagica	Chimney Swift
Chaetura vauxi	Vaux's Swift*
Tachornis phoenicobia	Antillean Palm-Swift*
TROCHILIDAE	
Amazilia yucatanensis	Buff-bellied Hummingbird
Calliphlox evelynae	Bahama Woodstar*
Archilochus colubris	Ruby-throated Hummingbird
Archilochus alexandri	Black-chinned Hummingbird
Calypte anna	Anna's Hummingbird*
Stellula calliope	Calliope Hummingbird*
Selasphorus platycercus	Broad-tailed Hummingbird*
Selasphorus rufus	Rufous Hummingbird
Selasphorus sasin	Allen's Hummingbird*
ALCEDINIDAE	
Ceryle alcyon	Belted Kingfisher
PICIDAE	
Melanerpes erythrocephalus	Red-headed Woodpecker
Melanerpes aurifrons	Golden-fronted Woodpecker*
Melanerpes carolinus	Red-bellied Woodpecker
Sphyrapicus varius	Yellow-bellied Sapsucker
Picoides pubescens	Downy Woodpecker
Picoides villosus	Hairy Woodpecker
Picoides borealis	Red-cockaded Woodpecker
Colaptes auratus	Northern Flicker
Dryocopus pileatus	Pileated Woodpecker
Campephilus principalis	Ivory-billed Woodpecker (x)
TYRANNIDAE	
Contopus cooperi	Olive-sided Flycatcher
Contopus sordidulus	Western Wood-Pewee*
Contopus virens	Eastern Wood-Pewee
Contopus caribaeus	Cuban Pewee*
Empidonax flaviventris	Yellow-bellied Flycatcher
Empidonax virescens	Acadian Flycatcher
Empidonax alnorum	Alder Flycatcher
Empidonax traillii	Willow Flycatcher
Empidonax minimus	Least Flycatcher
Sayornis nigricans	Black Phoebe*
Sayornis phoebe	Eastern Phoebe
Sayornis saya	Say's Phoebe*
Pyrocephalus rubinus	Vermilion Flycatcher
Myiarchus cinerascens	Ash-throated Flycatcher
Myiarchus crinitus	Great Crested Flycatcher

Myiarchus tyrannulus	Brown-crested Flycatcher
Myiarchus sagrae	La Sagra's Flycatcher
Myiodynastes luteiventris	Sulphur-bellied Flycatcher*
Empidonomus varius	Variegated Flycatcher*
Tyrannus melancholicus	Tropical Kingbird*
Tyrannus vociferans	Cassin's Kingbird*
Tyrannus verticalis	Western Kingbird
Tyrannus tyrannus	Eastern Kingbird
Tyrannus dominicensis	Gray Kingbird
Tyrannus caudifasciatus	Loggerhead Kingbird*
Tyrannus forficatus	Scissor-tailed Flycatcher
Tyrannus savana	Fork-tailed Flycatcher
LANIIDAE	
Lanius ludovicianus	Loggerhead Shrike
VIREONIDAE	
Vireo griseus	White-eyed Vireo
Vireo crassirostris	Thick-billed Vireo*
Vireo bellii	Bell's Vireo
Vireo flavifrons	Yellow-throated Vireo
Vireo solitarius	Blue-headed Vireo
Vireo gilvus	Warbling Vireo
Vireo philadelphicus	Philadelphia Vireo
Vireo olivaceus	Red-eyed Vireo
Vireo flavoviridis	Yellow-green Vireo*
Vireo altiloquus	Black-whiskered Vireo
CORVIDAE	
Cyanocitta cristata	Blue Jay
Aphelocoma coerulescens	Florida Scrub-Jay
Corvus brachyrhynchos	American Crow
Corvus ossifragus	Fish Crow
ALAUDIDAE	
Eremophila alpestris	Horned Lark
HIRUNDINIDAE	
Progne subis	Purple Martin
Progne cryptoleuca	Cuban Martin*
Progne elegans	Southern Martin*
Tachycineta bicolor	Tree Swallow
Tachycineta cyaneoviridis	Bahama Swallow*
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Riparia riparia	Bank Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Petrochelidon fulva	Cave Swallow
Hirundo rustica	Barn Swallow
PARIDAE	
Poecile carolinensis	Carolina Chickadee
Baeolophus bicolor	Tufted Titmouse
SITTIDAE	
Sitta canadensis	Red-breasted Nuthatch
Sitta carolinensis	White-breasted Nuthatch
Sitta pusilla	Brown-headed Nuthatch

CERTHIIDAE	
Certhia americana	Brown Creeper
TROGLODYTIDAE	
Salpinctes obsoletus	Rock Wren*
Thryothorus ludovicianus	Carolina Wren
Thryomanes bewickii	Bewick's Wren*
Troglodytes aedon	House Wren
Troglodytes troglodytes	Winter Wren
Cistothorus platensis	Sedge Wren
Cistothorus palustris	Marsh Wren
PYCNONOTIDAE	
Pycnonotus jocosus	Red-whiskered Bulbul (e)
REGULIDAE	
Regulus satrapa	Golden-crowned Kinglet
Regulus calendula	Ruby-crowned Kinglet
SYLVIIDAE	
Polioptila caerulea	Blue-gray Gnatcatcher
TURDIDAE	
Oenanthe oenanthe	Northern Wheatear*
Sialia sialis	Eastern Bluebird
Catharus fuscescens	Veery
Catharus minimus	Gray-cheeked Thrush
Catharus ustulatus	Swainson's Thrush
Catharus guttatus	Hermit Thrush
Hylocichla mustelina	Wood Thrush
Turdus migratorius	American Robin
Ixoreus naevius	Varied Thrush*
MIMIDAE	
Dumetella carolinensis	Gray Catbird
Mimus polyglottos	Northern Mockingbird
Mimus gundlachii	Bahama Mockingbird
Oreoscoptes montanus	Sage Thrasher*
Toxostoma rufum	Brown Thrasher
Toxostoma curvirostre	Curve-billed Thrasher*
STURNIDAE	
Sturnus vulgaris	European Starling (e)
MOTACILLIDAE	
Anthus rubescens	American Pipit
Anthus spragueii	Sprague's Pipit
BOMBYCILLIDAE	
Bombycilla cedrorum	Cedar Waxwing
PARULIDAE	
Vermivora bachmanii	Bachman's Warbler (x)
Vermivora pinus	Blue-winged Warbler
Vermivora chrysoptera	Golden-winged Warbler
Vermivora peregrina	Tennessee Warbler
Vermivora celata	Orange-crowned Warbler

Vermivora ruficapilla	Nashville Warbler
Parula americana	Northern Parula
Dendroica petechia	Yellow Warbler
Dendroica pensylvanica	Chestnut-sided Warbler
Dendroica magnolia	Magnolia Warbler
Dendroica tigrina	Cape May Warbler
Dendroica caerulescens	Black-throated Blue Warbler
Dendroica coronata	Yellow-rumped Warbler
Dendroica nigrescens	Black-throated Gray Warbler
Dendroica chrysoparia	Golden-cheeked Warbler*
Dendroica virens	Black-throated Green Warbler
Dendroica townsendi	Townsend's Warbler
Dendroica fusca	Blackburnian Warbler
Dendroica dominica	Yellow-throated Warbler
Dendroica pinus	Pine Warbler
Dendroica kirtlandii	Kirtland's Warbler*
Dendroica discolor	Prairie Warbler
Dendroica palmarum	Palm Warbler
Dendroica castanea	Bay-breasted Warbler
Dendroica striata	Blackpoll Warbler
Dendroica cerulea	Cerulean Warbler
Mniotilta varia	Black-and-white Warbler
Setophaga ruticilla	American Redstart
Protonotaria citrea	Prothonotary Warbler
Helmitheros vermivorus	Worm-eating Warbler
Limnothlypis swainsonii	Swainson's Warbler
Seiurus aurocapillus	Ovenbird
Seiurus noveboracensis	Northern Waterthrush
Seiurus motacilla	Louisiana Waterthrush
Oporornis formosus	Kentucky Warbler
Oporornis agilis	Connecticut Warbler
Oporornis philadelphia	Mourning Warbler
Oporornis tolmiei	MacGillivray's Warbler*
Geothlypis trichas	Common Yellowthroat
Wilsonia citrina	Hooded Warbler
Wilsonia pusilla	Wilson's Warbler
Wilsonia canadensis	Canada Warbler
Icteria virens	Yellow-breasted Chat
COEREBIDAE	
Coereba flaveola	Bananaquit
THRAUPIDAE	
Piranga rubra	Summer Tanager
Piranga olivacea	Scarlet Tanager
Piranga ludoviciana	Western Tanager
Spindalis zena	Western Spindalis
EMBERIZIDAE	
Tiaris olivacea	Yellow-faced Grassquit*
Tiaris bicolor	Black-faced Grassquit*
Pipilo chlorurus	Green-tailed Towhee*
Pipilo maculatus	Spotted Towhee*
Pipilo erythrophthalmus	Eastern Towhee

Aimophila aestivalis	Bachman's Sparrow
Spizella arborea	American Tree Sparrow*
Spizella passerina	Chipping Sparrow
Spizella pallida	Clay-colored Sparrow
Spizella pusilla	Field Sparrow
Pooecetes gramineus	Vesper Sparrow
Chondestes grammacus	Lark Sparrow
Amphispiza bilineata	Black-throated Sparrow*
Calamospiza melanocorys	Lark Bunting*
Passerculus sandwichensis	Savannah Sparrow
Ammodramus savannarum	Grasshopper Sparrow
Ammodramus henslowii	Henslow's Sparrow
Ammodramus leconteii	Le Conte's Sparrow
Ammodramus nelsoni	Nelson's Sharp-tailed Sparrow
Ammodramus caudacutus	Saltmarsh Sharp-tailed Sparrow
Ammodramus maritimus	Seaside Sparrow
Passerella iliaca	Fox Sparrow
Melospiza melodia	Song Sparrow
Melospiza lincolnii	Lincoln's Sparrow
Melospiza georgiana	Swamp Sparrow
Zonotrichia albicollis	White-throated Sparrow
Zonotrichia querula	Harris's Sparrow*
Zonotrichia leucophrys	White-crowned Sparrow
Zonotrichia atricapilla	Golden-crowned Sparrow*
Junco hyemalis	Dark-eyed Junco
Calcarius lapponicus	Lapland Longspur
Calcarius ornatus	Chestnut-collared Longspur*
Plectrophenax nivalis	Snow Bunting
CARDINALIDAE	
Cardinalis cardinalis	Northern Cardinal
Pheucticus ludovicianus	Rose-breasted Grosbeak
Pheucticus melanocephalus	Black-headed Grosbeak
Guiraca caerulea	Blue Grosbeak
Passerina amoena	Lazuli Bunting*
Passerina cyanea	Indigo Bunting
Passerina ciris	Painted Bunting
Spiza americana	Dickcissel
ICTERIDAE	
Dolichonyx oryzivorus	Bobolink
Agelaius phoeniceus	Red-winged Blackbird
Agelaius humeralis	Tawny-shouldered Blackbird*
Sturnella magna	Eastern Meadowlark
Sturnella neglecta	Western Meadowlark*
Xanthocephalus xanthocephalus	Yellow-headed Blackbird
Euphagus carolinus	Rusty Blackbird
Euphagus cyanocephalus	Brewer's Blackbird
Quiscalus quiscula	Common Grackle
Quiscalus major	Boat-tailed Grackle
Molothrus bonariensis	Shiny Cowbird
Molothrus aeneus	Bronzed Cowbird
Molothrus ater	Brown-headed Cowbird
Icterus spurius	Orchard Oriole

Icterus pectoralis	Spot-breasted Oriole (e)
Icterus galbula	Baltimore Oriole
FRINGILLIDAE	
Carpodacus purpureus	Purple Finch
Carpodacus mexicanus	House Finch (e)
Loxia curvirostra	Red Crossbill*
Carduelis pinus	Pine Siskin
Carduelis tristis	American Goldfinch
Coccothraustes vespertinus	Evening Grosbeak
PASSERIDAE	
Passer domesticus	House Sparrow (e)

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CHANGES IN OBSERVABILITY OF ADULT NINE-BANDED ARMADILLOS OVER THE SUMMER: OBSERVER EFFECT OR SEASONAL DECLINE?

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Abstract.—During a seven year (1992-1998) field study of nine-banded armadillos (*Dasypus novemcinctus*) in northern Florida, the number of adult armadillos observed per hour of observation declined significantly across the field season (mid June through late August). Such a decline could be due to a number of factors, including learned avoidance of the observers. As opposed to explanations based on seasonal changes, the observer effect hypothesis predicts that the number of armadillos observed per hour should decrease with increasing time in the field, regardless of when this time occurs. In 1999 we had an opportunity to test this prediction because our field season started and ended earlier (mid May through the end of July) than previously. We found a significant negative relationship between the number of adults observed per hour of observation and the number of days the population had been observed when data from all years were pooled, and in 4 of 7 field seasons when data from each year were analyzed separately. Most importantly, a significant negative relationship was obtained in 1999. Weather data and information on captures and resightings of individuals provided no evidence that the decline in 1999 was due to exceptional conditions occurring only that year. However, the number of adults observed per hour of observation was significantly higher in May of 1999 than in June of previous years, suggesting that there may be a longer-term seasonal decline in armadillo observability that is not due to an observer effect. To the extent that an observer effect occurs, it may amplify this long-term seasonal decline to produce the patterns we report here.

One perennial problem in field studies of wild animals is the extent to which the behavior of the animals is influenced by the presence of a human observer. For example, Isbell and Young (1993) showed that predators of vervet monkeys (*Cercopithecus aethiops*) shifted the timing of their attacks to periods when human observers of the monkeys were not present. In the present study, we examine the potential for an observer effect in a population of nine-banded armadillos (*Dasypus novemcinctus*).

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In a previous study (McDonough and Loughry 1997), the number of adult armadillos observed per hour of observation was significantly lower in August (toward the end of the field season) than in June (at the beginning of the field season). There are many possible explanations for this effect. For example, seasonal changes in weather patterns or prey abundance might alter the timing and extent of activity (Layne and Glover 1985, Inbar and Mayer 1999), or the animals might be just as active but less detectable as a result of vegetation growth over the summer. Alternatively, the decline might be associated with mating behavior (McDonough 1997), with more adults being observed during the peak of the breeding season in June and early July (McDonough 2000) and declining subsequently. Finally, it is possible that, due to repeated exposure to the observers over the course of the summer, adult armadillos learn to avoid them. Unlike the other hypotheses, this last hypothesis predicts a decline in observations of adults with increasing days of observation, regardless of when those days occur. In this paper, we test this prediction by examining data from our 1999 field season, which began and ended earlier than normal (mid May to the end of July). If seasonal effects drive the decline in observations of adults, less of an effect should be observed in 1999 because the field season ended before the decline becomes pronounced. On the other hand, if learned avoidance is an important factor, then the decline should still occur because the animals had the same amount of exposure to human observers as in previous years.

Methods

Data were collected on the nine-banded armadillos inhabiting Tall Timbers Research Station, Leon County, Florida. With the exception of 1996, this population has been studied each summer since 1992 (seven field seasons total). Basic procedures are described in detail elsewhere (McDonough and Loughry 1997, Loughry and McDonough 1998a, McDonough et al. 2000). Briefly, we censused the population each night by walking or driving along roads on the property. We attempted to capture all unmarked armadillos observed during these censuses by using large dip nets attached to 1.5 or 2 m poles. Once captured, animals were weighed, measured, and marked for permanent identification with a passive induced transponder (PIT) tag injected under the skin and for long-range identification with reflective tape glued to the carapace. In addition, an ear notcher was used to obtain small tissue samples for genetic studies. Once captured and marked, animals were not recaught again during the year unless the reflective tape had worn off and they needed to be remarked.

Data from these censuses were used to calculate the number of adult (≥1 year old) and juvenile armadillos observed per hour of observation each day. Unmarked animals observed but not captured were assigned to age groups on the basis of body size (McDonough 1994, Loughry and McDonough 1996, McDonough et al. 1998). Resightings of the same individual on the same day were not counted to avoid pseudoreplication.

We used linear regression (Statview 4.01) to examine the relationship between the number of adults seen per hour of observation and the number of days of observation from the beginning of the field season, using both all hours of observation each day (8:00-24:00), and just nighttime hours (16:00-24:00), when adults are usually most ac-

tive (McDonough and Loughry 1997). We followed Brunig and Kintz (1977) in calculating the statistical significance of differences between regression coefficients.

To further examine potential evidence for an observer effect, we looked at the patterns of captures and resightings of individual armadillos in each year of the study. We first tallied the total number of individuals observed each year, then determined the number of individuals from this total that were (a) never seen again that year or in any subsequent year; (b) never seen again that year but were observed in some subsequent year; and (c) resighted during the same field season. For this last group we calculated the average number of resights per individual and the average number of days between successive sightings. These data were analyzed for age and sex differences in resight patterns with a two-way ANOVA (Statview 4.01).

It is possible that any pattern of armadillo observations obtained in 1999 could be due to exceptional circumstances making that year unique. We attempted to evaluate this possibility in two ways. First, we compiled our resight data by month for each year of the study. We used these data to compare patterns obtained in 1999 with those observed from 1992-1998, reasoning that, if armadillos responded to us as they had in previous years, then data for May of 1999 should be similar to that from June of 1992-1998, June of 1999 should mirror data from July,1992-1998, and so on. Second, data from the Tall Timbers weather station were used to compare climatic conditions between years. Based on previous analyses of the relationship between weather conditions and armadillo activity patterns (McDonough and Loughry 1997), daily minimum and maximum air temperature, and amount of precipitation were selected as the critical variables for comparison. In cases where weather station data were not available, we substituted observations from the Tallahassee Regional Airport (National Climatic Data Center database), located approximately 25 km south of Tall Timbers. Using *t*-tests, we compared data from each month of the 1999 field season (May, June, and July) with the pooled data from the corresponding month in 1992-1998 (excluding 1996).

Seasonal effects might still be invoked to explain a significant decline in armadillo observability in 1999 if such a decline includes more than just the June to August period sampled previously (T. Engstrom pers. comm.). For example, if the number of adult armadillos observed per hour of observation was highest in May and declined in each subsequent month of the summer, then data from 1992-1998 would represent a sampling of the latter part of this decline, while data from 1999 represent a sampling of the earlier component. In order for this hypothesis to be valid, numbers of adult armadillos observed per hour in May must be higher than numbers observed later (e.g., June). We tested this prediction in two ways. First, we used a paired *t*-test to compare numbers of armadillos observed per hour of observation for each of the first 17 days of the 1999 field season (which encompassed sampling in May) versus the first 17 days of sampling in 1992-1998 (which encompassed sampling in June; data were averaged across the years 1992-1998 for this comparison). Second, because of variable starting dates in the field each year (Table 1) a paired comparison required elimination of some later sampling dates that still occurred within the appropriate month (e.g., days 18-20 of 1999 occurred in May but occurred in June or July of 1992-1998). Thus, to include all appropriate sampling dates, we used an unpaired *t*-test to compare average numbers of armadillos observed per hour of observation in May of 1999 with numbers observed in June of 1992-1998.

In what follows, means are reported ±SD.

RESULTS

Consistent with previous analyses (McDonough and Loughry 1997), when data from all years (1992-1999) were analyzed, there was a significant decline in the number of adults observed per hour of ob-

Table 1. Results of regression analyses of the numbers of adult nine-banded armadillos observed per hour of observation and the number of days the population was observed for each year of the study.

Year	Starting and ending dates	Number of observation days	r (Nights only)	Years different	r (All hours)	Years different
1992	15 June-29August	61 (60)	-0.37**	none	-0.26*	1994
1993	21 May-18 August	45 (43)	-0.34*	none	-0.22	1994
1994	14 June-26 August	44 (38)	-0.52***	1998	-0.72***	all but 1999
1995	19 June-23 August	49 (49)	-0.25	none	-0.22	1994
1997	16 June-15 August	50 (48)	-0.27	none	-0.21	1994
1998	15 May-22 August	52 (48)	-0.04	1994, 1999	-0.16	1994, 1999
1999	10 May-30 July	63 (62)	-0.55***	1998	-0.50***	1998

*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$; sampling in May consisted of 1 day each in 1993 and 1998, and 20 days in 1999 (regular sampling began on 16 June in 1993 and 15 June in 1998). For number of observation days, sample sizes for number of nighttime observations are given parenthetically. Years different column indicates which regression coefficients from other years differed significantly from those of the selected year.

servation with increasing numbers of days in the field, regardless of whether all hours of observation were included ($r = -0.23$, $P < 0.001$, $n = 362$, Fig. 1) or just those from the night ($r = -0.22$, $P < 0.0001$, $n = 348$). The same results were obtained when only data from 1992 through 1998 were used (for all hours of observation, $r = -0.19$, $P < 0.008$, $n = 299$; for nights only, $r = -0.18$, $P < 0.002$, $n = 286$, Fig. 1). Also consistent with our earlier analyses, observations of juveniles did not covary with number of days of observation (pooled data from all years and all hours of observation, $r = 0.05$, $P = 0.37$, $n = 362$).

Separate examination of each field season showed a significant decline in numbers of adult armadillos observed per hour with increasing numbers of observation days in 3 of 7 years when all hours of observation were included (Table 1), and in 4 of 7 years when only nighttime hours were included (Table 1; the value for 1997 is marginally significant, $P < 0.07$). Most importantly, a highly significant negative relationship between observations of adults and number of days of observation was found in 1999 (Table 1).

In general, regression values were similar between years (Table 1), although the relationship in 1994 was very different from that in any other year when all hours of observation were included, but less so when just nighttime hours were examined. The regression coefficients obtained in 1999 were significantly different from those obtained using pooled data from 1992-1998 (all hours, $Z = 2.52$, $P = 0.012$; nights only, $Z = 3.05$, $P = 0.002$). However, separate comparisons of 1999 with each of the other field seasons revealed significant differences with 1998 only (Table 1).

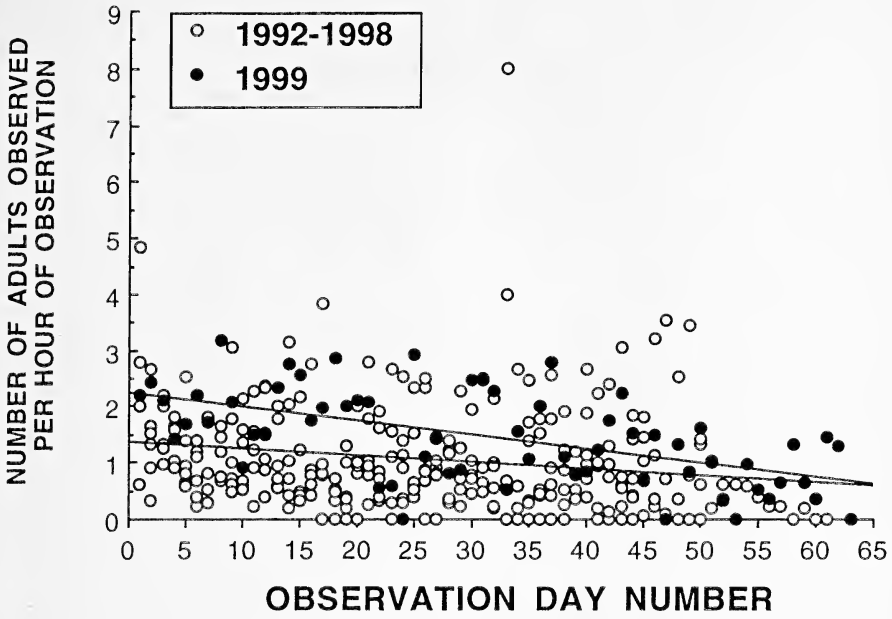

Figure 1. Relationship between number of adult armadillos observed per hour of observation and the number of days the armadillos had been observed. The upper regression line was generated using data from 1999 only, the lower line used data from 1992-1998. Both lines were calculated using data from all hours of observation (day + night) each day. See the text and Table 1 for the statistical results of these analyses.

In each field season, ≥ 46.7% of the animals observed were only seen once (combining the third and fourth columns of Table 2). Even those that were resighted within the same field season averaged only 2.02 ± 1.57 additional sightings, with an interval of 15.70 ± 12.98 days between successive sightings (Table 2; pooled across all years and all individuals). Pooled across all years, the average number of resights per individual did not differ between age classes or between males and females (two-way ANOVA, $P = 0.50$ for age main effect and $P = 0.82$ for sex main effect, age by sex interaction was also not significant, $P = 0.23$). However, there was a significant age, but not sex, difference in the average number of days between successive sightings ($P = 0.0004$ for age main effect; $P = 0.66$ for sex main effect; $P = 0.97$ for age by sex interaction).

Patterns of observations in 1999 were similar to those in 1992-1998 (Table 3). The distribution of captures for individuals that were subsequently resighted that year as well as the total number of individuals observed per month were not significantly different between 1999 and 1992-1998 ($\chi^2 = 2.61$, $P = 0.27$ for new captures, $\chi^2 = 0.37$, $P = 0.83$ for total individuals). The average number of resights per individual and

Table 2. Capture and resight data for armadillos at Tall Timbers each year of the study.

Year	Number captured	Number never seen again (% of total)	Number not resighted until following year(s) (% of total)	Number resighted within year		Average number of resights per individual		Average number of days between resights	
				Adults	Juveniles	Adults	Juveniles	Adults	Juveniles
1992	72	23 (38.9)	20 (27.8)	13	11	2.31	2.18	24.48	5.87
1993	94	27 (28.7)	28 (29.8)	28	11	1.57	2.27	16.53	12.94
1994	49	12 (24.5)	27 (55.1)	7	3	1.86	1.00	20.07	3.33
1995	136	66 (48.5)	32 (23.5)	32	6	1.63	2.50	15.00	16.11
1997	112	39 (34.8)	44 (39.3)	27	2	1.44	1.00	22.43	2.50
1998	225	67 (29.8)	38 (16.9)	109	11	2.28	1.73	15.48	5.30
1999	170	—	—	78	0	2.17	—	15.83	—

Data for adults includes yearlings as well. Number captured excludes animals found dead.

Table 3. Capture and resight data by month for adult and yearling armadillos at Tall Timbers, for each year of the study.

	Month 1			Month 2			Month 3		
Year	*n*	Number of resights	Days between resights	*n*	Number of resights	Days between resights	*n*	Number of resights	Days between resights
1992	6 (16)	2.83	25.65	6 (23)	2.00	24.72	1 (18)	1.00	16.00
1993	23 (39)	1.61	16.89	2 (42)	1.00	30.00	3 (21)	1.67	4.83
1994	6 (34)	2.00	21.58	1 (6)	1.00	11.00	0 (7)	—	—
1995	19 (36)	1.79	16.17	12 (63)	1.42	13.97	1 (18)	1.00	5.00
1997	18 (49)	1.44	27.71	9 (51)	1.44	11.86	0 (17)	—	—
1998	62 (98)	2.36	15.29	39 (150)	2.08	11.36	0 (46)	—	—
1999	58 (88)	2.40	15.99	19 (98)	1.53	15.84	1 (38)	1.00	6.00

For years 1992-1998, month 1 = June, month 2 = July, and month 3 = August. For 1999, month 1 = May, month 2 = June, and month 3 = July. Sample sizes refer to the number of individuals first observed during each month that were subsequently resighted during the field season. The total number of live animals observed each month (which includes resightings of animals caught earlier in the field season and animals first seen that month but not again during that year) is given parenthetically.

average number of days between sightings also did not differ between 1999 and 1992-1998 for comparable months (e.g., month 1 = May of 1999 versus June of 1992-1998; *t*-tests for all comparisons, all $P > 0.15$; no comparisons were made for month 3 because of small sample sizes, see Table 3).

There was little indication of unusual weather conditions in 1999. Pooled across months, there were no differences in weather conditions in May-July 1999 versus May-July of 1992-1998 (*t*-tests, all $P > 0.10$; see Table 4). However, month-by-month comparisons showed that June and July of 1999 had significantly higher minimum air temperatures than in previous years (Table 4). Weather conditions did not differ significantly between 1999 and 1992-1998 in any other comparison of corresponding months (Table 4).

Finally, there was evidence of a longer term seasonal decline in armadillo observability. The number of adult armadillos observed per hour of observation was significantly higher in May of 1999 than in June of 1992-1998 in a paired comparison of the first 17 days of observation (1999 mean = 2.03 ± 0.55, 1992-1998 mean = 1.27 ± 0.41; $t = 4.80$, $P = 0.0002$) and in an unpaired comparison of all sampling days in May of 1999 versus all days of sampling in June of 1992-1998 (1999 mean = 2.07 ± 0.54, $n = 20$; 1992-1998 mean = 1.35 ± 0.74, $n = 104$; $t = 4.16$, $P = 0.0001$).

Table 4. Average (± SD) weather conditions at Tall Timbers during May, June, and July 1992-1998 and 1999.

	1992-1998	1999	*P**
May			
Maximum temperature (°C)	30.15 (3.09)	30.20 (2.18)	0.93
Minimum temperature (°C)	16.14 (3.49)	16.42 (3.61)	0.69
Precipitation (cm)	0.31 (1.22)	0.57 (1.92)	0.33
n	182	31	
June			
Maximum temperature (°C)	32.38 (3.32)	31.54 (1.60)	0.17
Minimum temperature (°C)	20.54 (2.20)	21.69 (1.07)	0.006
Precipitation (cm)	0.51 (1.21)	0.63 (1.21)	0.61
n	180	30	
July			
Maximum temperature (°C)	33.50 (2.08)	33.33 (2.40)	0.69
Minimum temperature (°C)	22.24 (1.27)	22.85 (1.04)	0.012
Precipitation (cm)	0.68 (1.44)	0.60 (1.04)	0.78
n	186	31	

*t-tests, data for 4 days in May of 1992-1998 were unavailable.

Discussion

There are many possible explanations for the decline in the number of adult nine-banded armadillos observed per hour of observation over the course of the summer at our study site. The results presented here provide some support for an observer effect such that adults learn to avoid observers, as well as for a longer term seasonal decline in armadillo observability. It seems likely that both of these factors, and possibly others we have yet to identify, work together to generate the patterns we report. For example, to the extent that an observer effect occurs, it may only amplify the underlying seasonal trend that is already present.

It is perhaps not surprising that we found some evidence of an observer effect. As described in the methods, our capturing and marking procedures undoubtedly stress the animals. We may even unintentionally generate stress on individuals not subject to capture by making noise as we move around during our censuses, perhaps mimicking the sounds of an approaching predator and causing the animals to flee the area. It is logical to assume the animals might learn to avoid such negative stimuli. What is not clear is how much exposure is required to generate this effect. While we are routinely present in the study site during the summer, we do not encounter the same individuals night after night (Table 2; Loughry and McDonough 1998b). Thus it seems that, if avoidance occurs, it can be generated with infrequent human contact. However, it also possible that extensive exposure to humans may eliminate any learned avoidance. The dramatic range expansion of *D. novemcinctus* in the last 150 years (Humphrey 1974, Taulman and Robbins 1996), which includes many areas with high human density, suggests that this species is highly adaptable and may habituate to the presence of human beings. Nonetheless, our data showed that nearly half the animals observed in any given year were only seen once. These animals could not all have been transients that were captured while residing temporarily within our study site because about half of them were seen again in a subsequent year, typically very close to where they were observed initially (Loughry and McDonough 1998b). While we did not do so for our analyses, factoring in these individuals would greatly lengthen our estimates of days between successive sightings, further supporting the notion that human contact may lead to avoidance of human observers. Armadillos might be able to avoid human observers by being active at times of day when observers are not present, or by shifting activity to parts of the home range not routinely sampled by us. This latter possibility might help explain the age difference in number of days between successive sightings. Juveniles remain within a very small area during their first summer above

ground (Loughry and McDonough 1998b), so they may have fewer options for relocation and, thus, may be found again more quickly.

One could argue that the case for an observer effect in our population is weak because it is based on the outcome of a single field season. We agree that additional years of sampling, on the same schedule as in 1999, are required to confirm that such an effect occurs. Nonetheless, it seems unlikely that data obtained in 1999 were due to unusual conditions making that year unique. Weather conditions (Table 4) were similar in 1999 to those seen in earlier years. Of particular interest with regard to an observer effect, analyses of data in Table 3 suggested that patterns of adult captures and resightings in 1999 were similar to those obtained in earlier years, but advanced by one month. Thus, data from May of 1999 were similar to those obtained in June of 1992-1998, June of 1999 was similar to July of 1992-1998 and so on. It is difficult to explain how this could occur if seasonal effects alone generated changes in armadillo observability, because one must argue that conditions in 1999 mimicked those that normally occur one month later. We found little evidence of this, although daily minimum air temperatures were significantly higher in June and July of 1999 than in previous years (Table 4). One might argue that these warmer temperatures represent conditions normally occurring later in the summer. While this could be true, we think it is unlikely to explain the results we obtained in 1999 because, in an earlier analysis (McDonough and Loughry 1997), armadillo activity was positively correlated with higher daily minimum temperatures. Based on this relationship, no decline in observations of armadillos in July of 1999 is predicted.

Weather and resight data suggest 1999 was not an unusual year, but conditions did vary between field seasons and may have contributed to the patterns we report here. For example, regression coefficients for 1994 (Table 1) were significantly different from those in every other year (when all hours of observation were included) probably because two tropical storms passed through Tall Timbers that year, resulting in some flooding of our study site and probably driving many animals out of our sampling areas (McDonough and Loughry 1997). Thus, any observer effect occurring in this year would have been greatly enhanced by the scarcity of animals due to flooding. On the other hand, 1998 exhibited the weakest relationship between number of days of observation and number of armadillos sighted per hour. We observed more animals in 1998 than in any other year (Tables 2 and 3), probably because Tall Timbers initiated a hardwood removal program that year that may have disturbed the animals and forced them into open areas where we could see them more easily. In this case, any observer effect may have been overwhelmed by the disruptions associated with timber removal.

Any discussion of an observer effect in our population must be tempered by the finding that armadillo observability was significantly higher in May of 1999 than in June of 1992-1998. Thus, it seems likely that there is a long-term seasonal decline in observability that lasts at least from May through August. Whether this pattern extends beyond these months will require sampling earlier and later in the year. Causes for this long-term seasonal decline are not obvious. Based on observations of mating activity (McDonough 2000), emergence of young (Loughry and McDonough 1998b), and annual cycles of activity (Layne and Glover 1985; Inbar and Mayer 1999), one might expect a peak in adult observability in June or early July, but not May. Alternatively, because armadillos do not hibernate and thus must forage year-round, one might expect that adults are equally active throughout the year but that observability changes due to changes in the conspicuousness of individuals (e.g., by foraging for less time or later at night, remaining in thick vegetation, etc.). Our data do not allow us to distinguish among these alternatives and further work will be required to identify the factors that produce the summer-long decline we have documented.

To the extent that adult armadillos do exhibit an observer effect, researchers may need to exercise some caution when developing sampling regimes for this species. Care should be taken to vary the times during the day when observers are present and either limit the exposure of each animal to human contact (to minimize the possibility of avoidance) or increase exposure while minimizing stress (to maximize the possibility of habituation). However, further work is required to more fully describe changes in adult observability over the course of the year so that the effects of seasonal changes and exposure to human observers might be more fully disentangled.

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FORAGING BEHAVIOR OF VULTURES IN CENTRAL FLORIDA

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Abstract.—Black Vultures (*Coragyps atratus*) and Turkey Vultures (*Cathartes aura*) overlap widely in their use of carrion and habitat types in the southeastern United States. I used a point count road survey method to study differences in vulture foraging behavior in central Florida. Black Vultures foraged at higher altitudes and in larger groups than Turkey Vultures (mean group size: Black Vultures 2.3 ± 2.0 SD, Turkey Vultures 1.7 ± 1.9 SD). Density over all point counts was higher for Turkey Vultures (0.80 individuals/km^2 ± 0.13 SD), than for Black Vultures (0.43 individuals/km^2 ± 0.36 SD). There were significant differences in the seasonal pattern of density observed between species. Turkey Vultures were most numerous in winter, probably due to an influx of migratory individuals.

The seven species of cathartid vultures are primarily carrion-eating scavengers. In many parts of North and South America, morphological and behavioral differences allow two or more species to coexist. Interspecific competition is reduced through differences in habitat use, foraging strategies, carcass size preferences, patterns of arrival at carcasses, and status in interspecific dominance hierarchies (Wallace and Temple 1987, Houston 1988, Lemon 1991, Gomez et al. 1994, Kirk and Houston 1995). In southeastern North America, Black and Turkey vultures overlap in their use of carrion (Yahner et al. 1986, Coleman and Fraser 1987) and habitat types (Stewart 1978, Coleman and Fraser 1989).

My objective in this study was to investigate differences in the foraging behavior of Black and Turkey vultures in central Florida. Information on how vultures locate carrion will help to understand how they partition resources and coexist in central Florida. Both Black and Turkey vultures have undergone population declines in parts of the southeastern United States in recent decades (Coleman and Fraser 1990, Rabenold 1990). Information on vulture life histories will be useful for future management and conservation efforts.

STUDY AREA AND METHODS

The study site was located in Osceola and Orange counties in central Florida, near the town of Kissimmee. The landscape surrounding the study area was a mixture of for-

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ested and open habitats (pasture); 51.7% of the land was used as farmland with 75.3% of this used as rangeland (Florida Office of Agricultural Statistics pers. comm.). Two permanent Black Vulture communal roosts were located within six km of the starting point of the road survey route. Mark-resighting data indicated that several thousand Black Vultures used this roost system during the study (Stolen 1996).

Point counts were based on the point transect method (Fuller and Mosher 1987). Point counts were conducted twice monthly from January through December 1993, between six and nine h after sunrise (n = 22). Each survey took approximately two h. Six stations at 8 km intervals were chosen along a 48 km route. At each station I stopped and scanned the sky for vultures for five min using 8.5 × 42 binoculars. I recorded the species, number, estimated altitude, estimated distance, and behavior for each observation. Birds that were observed within 200 m of each other at roughly the same altitude were recorded as a group.

Estimated altitude was recorded as: low (0-50 m), medium (50-250 m), and high (250+ m). I calibrated my height categories by observing vultures flying near a 150 m tower with cross-beams at regular intervals, after I had practiced placing birds within the three height classes. Distance was estimated as: near (0-200 m), medium (200-700 m), and far (700+ m). I calibrated distance categories by measuring distance to flying birds after I had practiced placing birds within the three distance classes. Distances for calibration were measured using a Bushnell 1000 m parallax-type range finder. Surveys were not conducted in rain, overcast conditions, or in high winds.

I modeled the association between species of vulture and altitude using a proportional odds model, a statistical regression-type model for ordered categorical response variables (Agresti 1996). Altitude of observations was treated as a multicategory logit, and species of vulture as the explanatory variable. To reduce any bias caused by obstruction of birds at low altitude and far distance, only near and medium distance observations were included in analysis of foraging altitude and density. Data from the six stations were pooled for each survey. Density was estimated based on the fixed-radius point count method (Verner 1985). I made no adjustment for detectability because I believe that I was able to detect all birds flying within 700 m of the observation points. Density measures were calculated based on a total area of 9.24 km^2 (six circular plots with radius of 700 m each). All observations were used for analysis of group size. Distributions of group sizes were compared using the Kolmogorov-Smirnov comparison of frequency distributions.

Overall differences in abundance between the species were analyzed using a Wilcoxon Signed-rank test. I used a contingency table analysis to test for differences in seasonal abundance between species. Seasons, based on vulture breeding seasons and Turkey Vulture migratory periods (Jackson 1988a, 1988b), were: Spring (March-May), Summer (June-August), Fall (September-November) and Winter (December-February). All statistical analysis were performed using SPSS (Norusis 1993) except for the proportional odds ratio which was performed using SAS (Stokes et al. 1995).

Results

Black Vultures foraged at higher altitudes than Turkey Vultures (Fig. 1). The proportional odds model fit well (goodness-of-fit test G^2 = 0.76, P = 0.38) and there was a significant association between species and altitude (likelihood-ratio test of H_0:$\beta = 0$, $P = 0.0001$). The odds that an individual was observed at a lower rather than a higher altitude were 7 times greater for Turkey Vultures than for Black Vultures (95% C.I. [4.07, 12.02]). The predicted probability of an individual being observed at low altitude was 0.094 for Black Vultures and 0.42 for Turkey

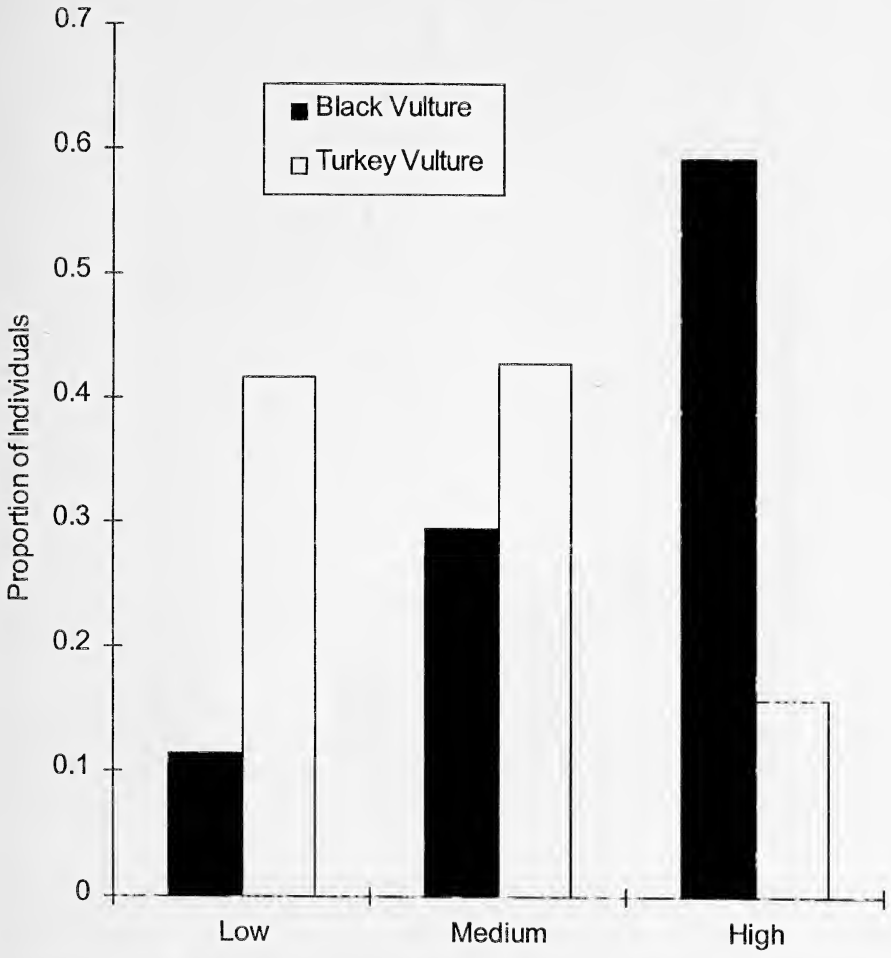

Figure 1. Proportions of foraging vultures observed in each of three altitude classes during surveys in central Florida. Altitude classes: low = 0 to 50 m, medium = 50 to 250 m, high = 250 m and above. Black Vultures foraged at higher altitudes than Turkey Vultures (Proportional Odds Model, $P = 0.0001$).

Vultures. The predicted probability of an individual being observed at high altitude was 0.58 for Black Vultures and 0.17 for Turkey Vultures.

Mean group size of Black Vultures was 2.3 (±2.0 SD), and of Turkey Vultures 1.7 (±1.9 SD); the median group size was two and one, respectively, while the modal group size was one for both species (Fig. 2). Comparison of the distribution of group sizes showed that overall Black Vultures were observed in larger groups than were Turkey Vultures (Kolmogorov-Smirnov z = 1.7820, $P = 0.004$, $n = 59$ for Black Vulture groups and $n = 123$ for Turkey Vulture groups).

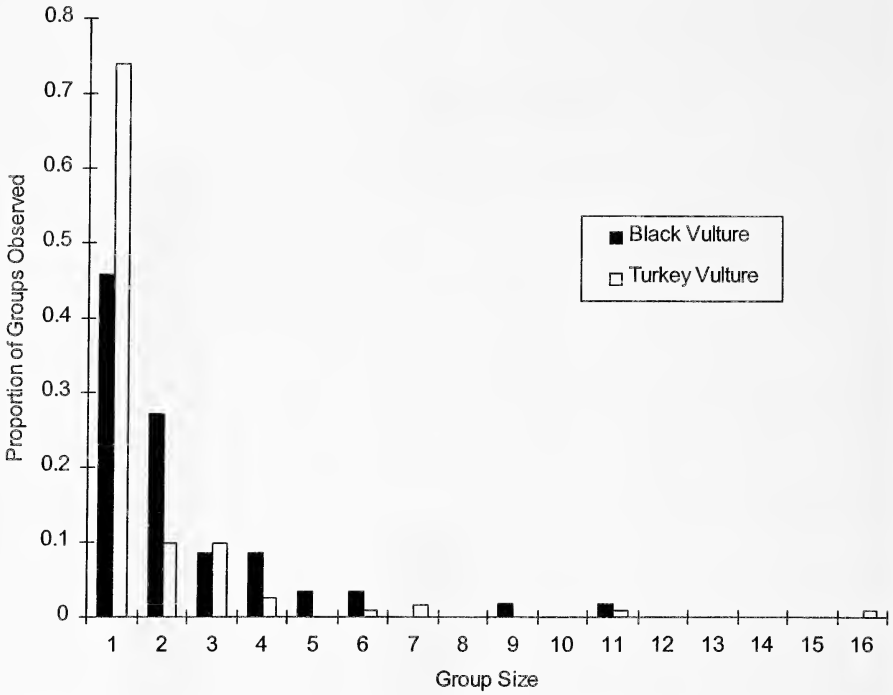

Figure 2. Group sizes of foraging vultures observed during surveys in central Florida. Black Vulture groups tended to be larger than Turkey Vulture groups (Kolmogorov-Smirnov Test, $P = 0.004$). Number of individuals: Turkey Vulture $n = 210$; Black Vulture $n = 136$. Number of groups: Turkey Vulture $n = 123$; Black Vulture $n = 59$.

Density of pooled point count surveys was greater for Turkey than Black vultures (0.80 ± 0.13 SD ind./km^2, and 0.43 ± 0.36 SD ind./km^2, respectively, Wilcoxon Signed-rank test $P = 0.0002$). The number of Turkey Vultures observed during point counts ranged from 0 to 25; the number of Black Vultures ranged from 0 to 12. There was a significant difference in the seasonal pattern of abundance between species ($G^2 = 18.62$, $P = 0.001$). Evaluation of cell counts revealed that winter counts contributed the most to the observed association between species and season. Turkey Vultures were more abundant in winter and less abundant in spring than during the other seasons; Black Vulture abundance changed little throughout the year but was higher in summer and fall than in winter and spring (Fig. 3).

Discussion

Foraging Behavior

Turkey Vultures foraged at lower altitudes than Black Vultures. This difference was expected given their difference in foraging strategy.

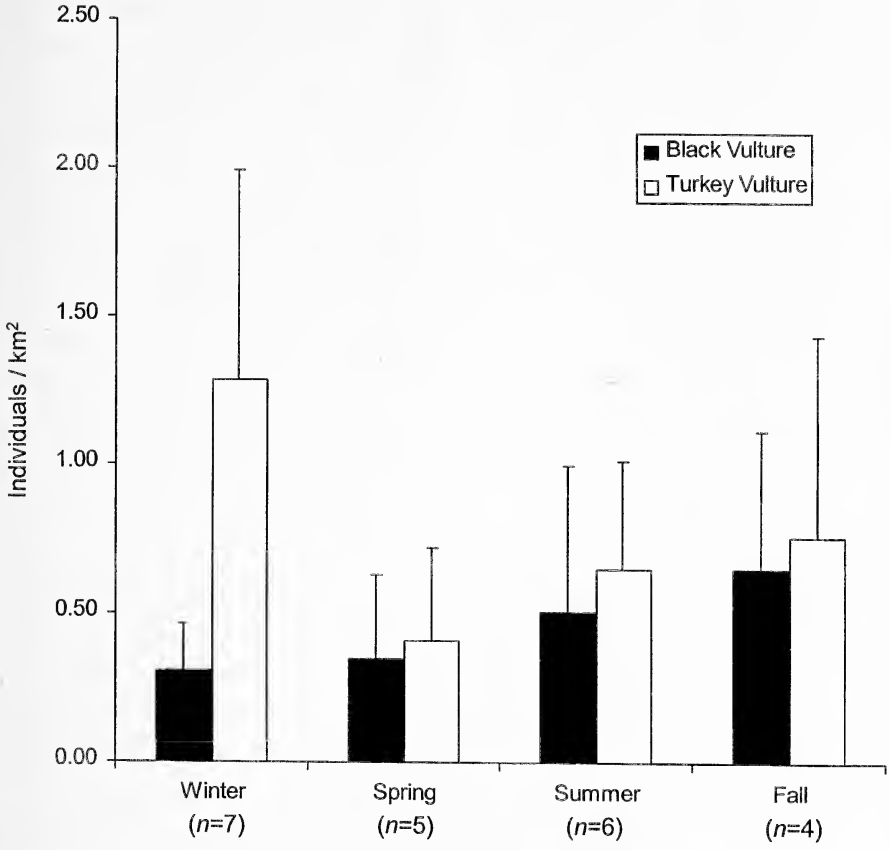

Figure 3. Seasonal density of foraging vultures in central Florida (error bar = 1 SD). Seasons: Winter = December through February, Spring = March through May, Summer = June through August, Fall = September through November. Seasonal pattern of abundance differed between species (Chi Square Analysis, $P < 0.001$). Turkey Vultures were most abundant in winter, probably because of the presence of individuals wintering in central Florida. Number of surveys is given beneath season.

Turkey Vultures locate carcasses primarily using olfaction and must remain close to the ground where odors are concentrated (Houston 1984, 1986). Black Vultures search for food visually, often using other vultures to locate carrion (Stewart 1978, Rabenold 1987a, Lemon 1991); they benefit by foraging at high altitudes where they can scan larger areas. In regions of their range lacking Black Vultures, Turkey Vultures maintain their unique foraging strategy and continue to use low altitude foraging (Prior and Weatherhead 1991b, Estrella 1994, Gomez et al. 1994).

Group size was significantly larger for Black than Turkey vultures. This is also related to foraging strategy. Black Vultures forage in

groups to take advantage of group feeding (Wallace and Temple 1987, Buckley 1996) and perhaps because individuals follow one another from communal roosts (Rabenold 1987a). Black Vultures also sometimes travel in family groups (Rabenold 1986, 1987b, Parker et al. 1995). A confounding factor in studying group foraging behavior in cathartid vultures is the difficulty in determining whether birds observed near one another are within a foraging group. Often during surveys I observed two or three Turkey Vultures foraging within several hundred meters of one another at different altitudes and moving independently. However, if one bird was to discover a carcass, the others could notice and join it at the carcass. Thus, vulture foraging groups may be dispersed more than 200 m, and I may have underestimated the number of vultures foraging in groups. It may not be meaningful to discuss foraging groups when foragers operate in a dispersed pattern within sight of one another (Kirk and Houston 1995).

Density Measures

Road survey methods are often used to estimate raptor abundance, and to investigate behavior; however, there are several concerns in using road survey methods (Fuller and Mosher 1981). Roads may coincide with geographic features and thus not be representative of the landscape. Some species may be attracted to, or repelled by, roads. Detectability may vary in different habitats along a survey route, biasing density measurements. Density estimates are based on measures of distances, which may be inaccurate (Verner 1985). Despite these concerns, road surveys can be useful if care is taken to control conditions. Vultures are good candidates for road surveys because they spend much of the day soaring and are highly visible.

Although road survey methods may not be suited to studies of vulture population demography (Hubbard 1983, Sweeny and Fraser 1986, Fraser and Coleman 1990), I believe that the road survey method I used was well suited to studying vulture foraging behavior. Vultures are large, conspicuous birds that are easily identified. They are active during specific time intervals and spend much of this time flying (Bunn et al. 1995). The survey route used during this study covered five different roads, none of which followed the same geographic features. I limited analysis of observations to those within 700 m to minimize bias due to visual obstruction. A weakness of fixed-distance methods is the potential bias caused by declining detectability with distance. Although it is possible to calculate detection functions and use these to correct for this bias (Verner 1985), I chose not to do so because I did not find a decline in detectability of flying birds within the transect strip.

My density estimates of vultures were specific to foraging vultures, and applied only to the time interval during surveys and to areas near

roads. The time interval was chosen to maximize the number of foraging vultures observed. Density of Turkey Vultures was nearly twice that of Black Vultures; however, I may have underestimated the number of Black Vultures because they forage at higher altitudes than Turkey Vultures, and thus, are possibly less detectable. Density estimates of Black and Turkey vultures in central Florida were less than those observed by Kirk and Currall (1994) in Venezuela. Density of Turkey Vultures was less than that observed by Houston (1986) in Panama. Several authors have noted that the suitability of habitat and availability of carcasses is directly correlated with the density of vultures observed (Houston 1987, Hiraldo et al. 1991, Kirk and Currall 1994). Thus, central Florida habitat may not be as good for vultures as that in Central and South America.

The higher density of Turkey Vultures observed in winter than in other seasons may reflect migrants wintering in central Florida; the lower density observed in spring could be due to individuals attending nests. The lower density of Black Vultures observed in winter and spring than in summer and fall may also be caused by a change in behavior associated with breeding activity. Seasonal trends may also result from changes in the availability of carcasses between seasons; vultures need to spend less time foraging when food is more readily available. Changes in the abundance of vultures in an area also might have been caused by movement of individuals in response to changes in food availability (Stolen 1996).

Because they are easy to perform and relatively inexpensive, road surveys may represent the best option for assessing populations of vultures in a given area. Hubbard (1983) suggested that road count surveys of Turkey Vultures may be useful in assessments of local raptor communities, since Turkey Vultures are relatively easy to survey and share many conservation concerns with other raptors. Houston (1987) suggested that counts of cathartid vultures could be used for rapid assessments of mammal populations in Neotropical forest sites. For these reasons, it would be beneficial for more work to be done to standardize methodology and reduce variability of roadcount data. Future research should be directed at standardizing density measurements obtained from point counts.

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NOTES

Florida Field Naturalist 28(4):182-185, 2000.

A RECORD OF TROPICAL KINGBIRD (*Tyrannus melancholicus*) IN FLORIDA

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Tropical Kingbird and (*Tyrannus melancholicus*) were the English and scientific names formerly applied to a tyrannid flycatcher complex resident in Middle America, northern South America, and Arizona and Texas (AOU 1957). Traylor (1979) re-evaluated the complex and concluded it was comprised of two species. The population resident northward along most of both coasts of Mexico, southern Arizona and Texas is now known as Tropical Kingbird (*T. melancholicus*) and the population resident along the Gulf of Mexico from the Yucatan Peninsula north into Texas, Couch's Kingbird (*T. couchii*). The two species are widely sympatric in eastern and southern Mexico, where limited hybridization may occur (AOU 1983, 1998).

Representatives of the complex sometimes stray eastward in North America (AOU 1998). First detected in Florida in 1942 (Stimson 1942), about 26 individuals subsequently have been reported from the state (Robertson and Woolfenden 1992). Following separation of the two species, seven *T. couchii* and one *T. melancholicus* were reported (Anderson 1996). However, no confirmed specimens or taped vocalizations of *T. melancholicus* were obtained.

A bird identified as a member of the Tropical/Couch's Kingbird was discovered at 1800 EST on 9 May 1998 at Fort DeSoto County Park, along the east end of Mullet Key, Pinellas County, Florida (27°37'43"N, 82°42'53"W) by Darlene and Melvin Gahr, Cheryl Libera and LFS. It was sally-feeding from roadside posts and nearby, taller shrubs. Because Ron W. Smith (pers. comm.) had extensively searched the area only two hours before the discovery, it is believed the bird had arrived shortly before it was found. As sunset approached, the bird became more active and moved about 500 meters farther east to the edge of a stand of mangroves at the easternmost end of Mullet Key. There the bird took a position on the tallest mangrove tree, a leafless snag, where it continued sally-feeding. The bird was reported on Mullet Key from 9 to 12 May and eventually heard calling and singing before it disappeared.

Traylor (1979) listed morphological characteristics that separate adults of the two species, (form of the wing tip, relative length of the bill, and differences in color and size), but these can be used only with specimens in hand. Vocalizations, however, are reportedly distinctive (Smith 1966, Traylor 1979, Kaufman 1983).

Observations on 9 May, the first day, were made with various binoculars and field scopes in good light for 90 minutes at distances of 5 to 20 meters. A five minute video tape recording (MJH) yielded a possible call note, but no song. Two simultaneous video/audio tape recordings of calls and call notes were made on 12 May (LAH and Marian J. Hopkins: Magnavox cassette recorder and player Model: D6280; Brooks H. Atherton: no information available).

We performed time-spectrogram analyses (Brian S. Nelson; FFT of 4096, 98.44% overlap and 1024 frame length) on the LAH recording (Fig. 1B) and commercial recordings of *T. melancholicus* (Fig 1A; Peterson 1992) and *T. couchii* (Fig 1C; Peterson 1992).

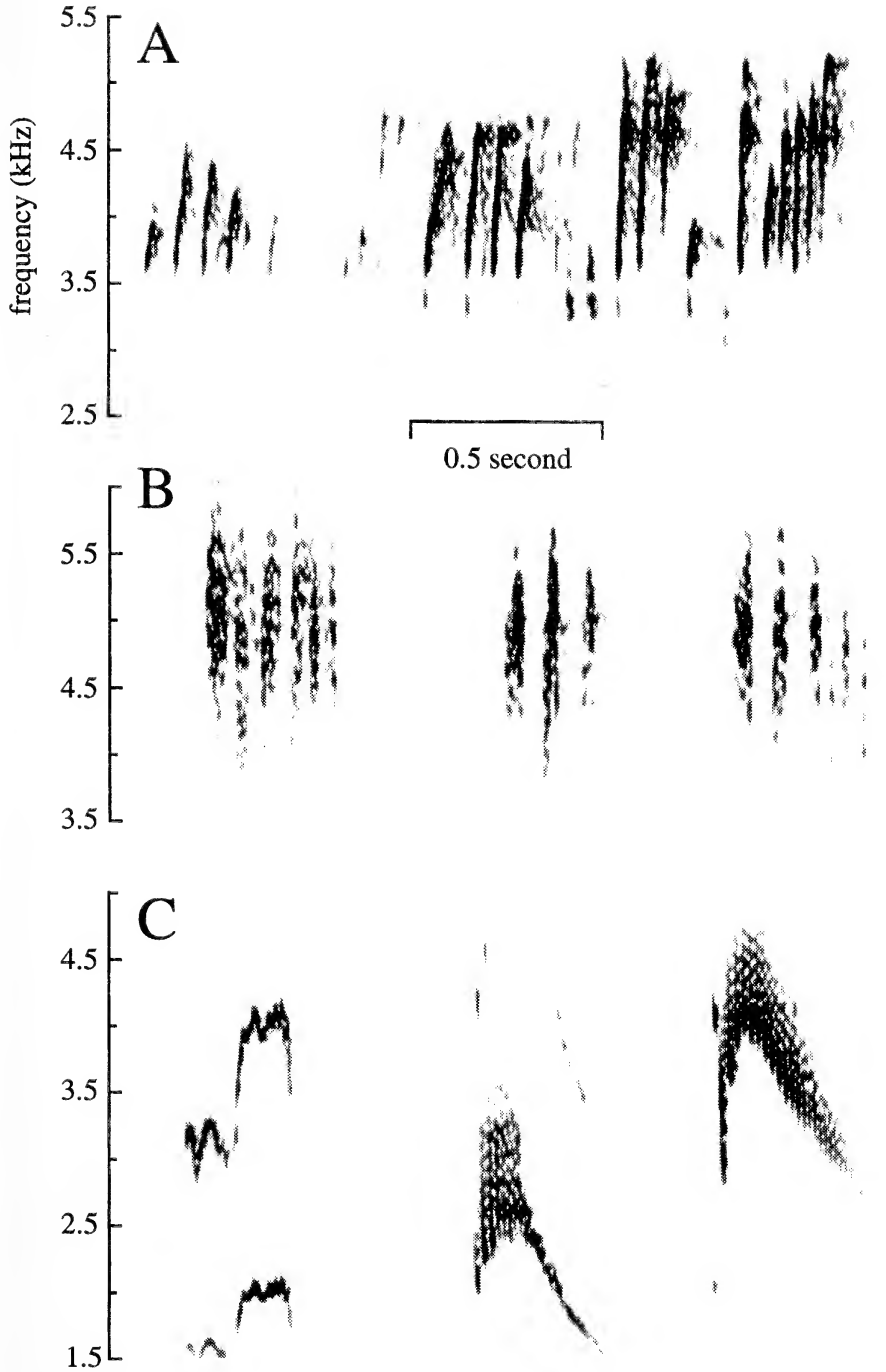

Figure 1. Vocalizations of (A) *T. melancholicus* (Peterson 1992); (B) *T. melancholicus* (LAH—see text); (C) *T. couchii* (Peterson 1992).

The LAH recordings were filtered below 3.0 kHz using the program "CANARY" (Charif et al. 1995) to remove background noise. Recordings were normalized to a constant peak amplitude before time-spectrogram production. W. John Smith (Department of Biology, University of Pennsylvania, Philadelphia) and M. Ross Lein (Department of Biology, University of Calgary, Calgary, Alberta, Canada) stated that the Florida taped song (Fig. 1B) represented *T. melancholicus*.

Photographs (LFS: Nikon F4, Nikon 600mm, f/5.6 lens, Nikon 2× Teleconverter, Kodak EPR rated 64 ISO) were taken on 12 May (Figure 2). Photographs and videotape containing the identifying song (LAH) are archived at Archbold Biological Station, Lake Placid, Florida.

Weather conditions for 1 to 8 May (St. Petersburg Times) showed no unusual weather patterns west of Florida over the Gulf of Mexico that may have aided in the bird's dispersal. Unusually hot weather persisted from most of Texas south to the Yucatan Peninsula for more than a week prior to the bird's discovery. However, a cold front that stretched from southern Texas eastward to the Georgia coast on 3 May and moved rapidly eastward and out over the Atlantic Ocean by 5 May (St. Petersburg Times May 1-8) could have altered the course of the Florida bird.

ACKNOWLEDGMENTS.—The authors wish to express their sincere appreciation to Dr. Glen Woolfenden for his untiring guidance and remarks in preparing this note. We thank W. John Smith and M. Ross Lein for reviewing the time-spectrogram and Brian S. Nelson for preparing the time-spectrograms. Thanks also to Susan Rallo, Ron W. Smith and Bill Pranty for their helpful comments. Special thanks to Judy Hopkins for contributions of identifying sound materials. Finally, the authors wish to express their gratitude to all of those who graciously shared their field notes and observations to help establish the first verifiable sighting and vocalization of the Tropical Kingbird in Florida.

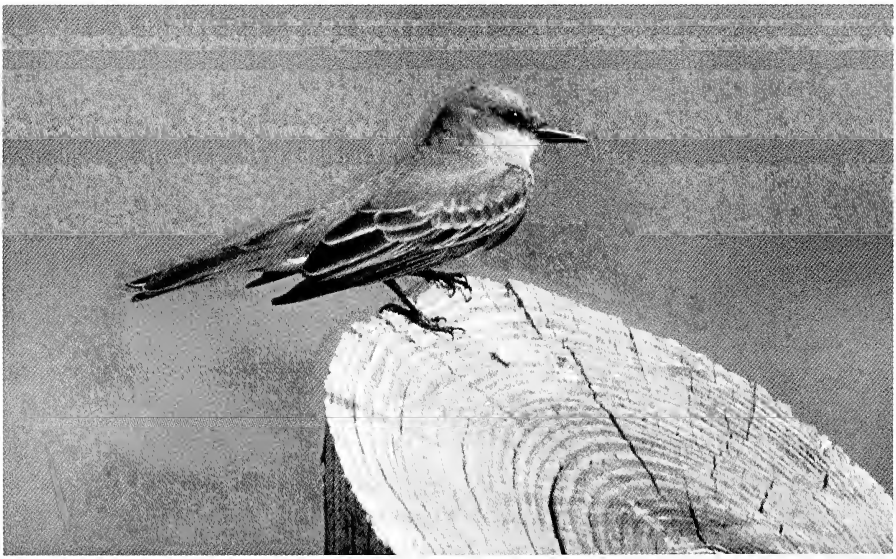

Figure 2. Tropical Kingbird in profile taken on 12 May 1998 at Fort DeSoto County Park, Pinellas County, Florida (LFS).

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RECORD OF A BLACK-THROATED GREEN WARBLER WINTERING IN FLORIDA

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At approximately 0930 hr on 26 February 2000, Dave Goodwin, Erik Haney, and I were birding in Matheson Hammock County Park, Miami-Dade County, Florida, when we came upon a flock of wood-warblers in an oak (*Quercus* spp.) grove. Yellow-rumped Warblers (*Dendroica coronata*) were most numerous, but the flock contained seven other species, including a Black-throated Green Warbler (*D. virens*). Aware that no published or archival material verified the occurrence of this species in Florida during the winter months (Robertson and Woolfenden 1992, Stevenson and Anderson 1994, reiterated in Pranty 1994, 1995, 1996), I photographed the bird (Fig. 1) from 6 to 8 m away with a Yashica 230-AF camera, Sigma 75-300 mm lens, and Kodak Gold Max film.

I noted the following field marks: bright yellow sides of the head, olive eye-stripes and ear patches, greenish-olive crown, nape, and back, black chin, throat, and flank streaking, bold white wing bars on black wings, and white underparts with pale yellow patches on the upper breast and vent. These field marks identify the bird as a male Black-throated Green Warbler in spring plumage (Dunn and Garrett 1997, Dickinson 1999). There are two subspecies of *D. virens* (AOU 1957, Dunn and Garrett 1997), but subspecific identification is difficult in the field, and many authors consider the Black-throated Green Warbler to be monotypic (Dunn and Garrett 1997). The wood-warbler occasionally uttered a sharp and somewhat high *chip* note as it moved about. It foraged in the lowest branches of an oak, and captured lepidopteran larvae at least four times while under observation. I learned later that P. William Smith (*in litt.*) and others saw two Black-throated Green Warblers in the same oak grove on 27 January 2000, which probably indicates that the individual I photographed indeed was wintering.

Robertson and Woolfenden (1992) called *D. virens*, "a winter visitor virtually throughout [the state] . . . regular, rare to locally fairly common in the Keys, and the southern and central peninsula, becoming very rare to rare, occasional to irregular northward (but possibly not verifiable Dec-Feb!)." P. William Smith (*in* Pranty 1994) claimed that the Black-throated Green Warbler, "probably is the most frequent of the 'rare' S[outh] Florida [wintering wood-warblers], apparently more numerous and widespread than American Redstart" (*Setophaga ruticilla*). Dozens of winter reports exist for *D. virens* in Florida (e.g., 58 or more individuals listed in the Field Observations section of *Florida Field Naturalist* between winter 1989-1990 and winter 1998-1999, inclusive), but there is no published evidence to indicate that any reports are verifiable (*sensu* Robertson and Woolfenden 1992).

The largest numbers of Black-throated Green Warblers listed in Stevenson and Anderson (1994) during winter are 11 individuals on the Fort Lauderdale Christmas Bird Count (CBC) in 1992, eight on the Lower Keys CBC in 1967 and seven on the 1991 CBC, and seven on the Fort Lauderdale CBC in 1979. A comparable count published in *Florida Field Naturalist* is seven individuals at Delray Beach, Palm Beach County, on 26 February 1995 (B. Hope *in* Pranty 1995).

Extreme dates of occurrence for Black-throated Green Warblers in Florida based upon specimens are 3 March to 13 May, and 3 October to 12 November (Stevenson and Anderson 1994). This note (Fig. 1) therefore provides the first published record of a Black-throated Green Warbler occurring in Florida during the winter months. Copies of some of my photographs have been archived at Tall Timbers Research Station (TTRS P 717).

Figure 1. Male Black-throated Green Warbler at Matheson Hammock County Park, Miami-Dade County, Florida, 26 February 2000. This provides the first published, verifiable winter record for the state. Photograph by Bill Pranty.

Acknowledgments.—I thank Dave Goodwin and Erik Haney for their company on the trip, P. William Smith for his observation, and Bruce Anderson, Todd Engstrom, and Rick West for improving the manuscript. This observation was made while in Miami-Dade County to attend the memorial service of William B. Robertson, Jr., in whose memory this modest note is dedicated.

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FIVE NESTING ATTEMPTS BY AN APPARENT PAIR OF EASTERN KINGBIRDS

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Eastern Kingbirds (*Tyrannus tyrannus*) are widely regarded to be single-brooded (Murphy 1983a,b, 1986; Robertson and Blancher 1985). One reported case of a second brood in one season is unusual, because three of the four young disappeared soon after fledging, well before the normal termination of parental care (Blancher and Robertson 1982, 1984). Moreover, the female at the second nest did not feed the remaining fledgling, suggesting that she may have been a replacement female (Peck 1984). M. T. Murphy (*in litt.*) noted that one or two pairs of Eastern Kingbirds usually attempt to nest three times each year at his study sites in New York; P. J. Blancher (*in litt.*) noted that several pairs attempted to nest as many as four times within a season in Ontario, although this is rare. This note documents five nesting attempts of one apparent pair of Eastern Kingbirds at Lake Jackson, Leon County, Florida, in 1999.

The breeding site is a small (about 1.5-ha) island that is separated from the nearby mainland by about 30 m of marsh and open water. Habitat on the island was similar to an overgrown old field with scattered shrubs and trees and one copse of buttonbush (*Cephalanthus occidentalis*) and black willow (*Salix nigra*). Only one pair of Eastern Kingbirds occurred on the island. The nearest two pairs were 1.2-1.6 km away (measured from a map).

The pair of Eastern Kingbirds used buttonbushes as nest-sites for all five breeding attempts, two of which occurred in the same bush at the same site (reused nest). All nests were placed on horizontal branches near the top of the tree and close to the canopy edge, in an outer crotch that contained 3-5 twigs which supported the nest. Mean nest placement characteristics ($n = 4$) were: nest height = 2.3 m; tree height = 2.8 m; relative nest height = 0.82 m; distance of nest from center of tree = 1.3 m; distance of nest from canopy edge = 0.5 m; and relative distance of nest from center of tree = 0.72 m. All nests contained feathers.

The nesting chronology for the five breeding attempts of the apparent pair of Eastern Kingbirds based on two visits per week throughout the breeding period was as follows.

Breeding attempt 1. I first observed the pair on territory on 10 April. On 1 May, I watched the male attack a Merlin (*Falco columbarius*) which was cruising the shoreline, and found a kingbird nest with two fresh eggs in an isolated tree (10 m from the copse). The nest contained three eggs when I flushed the incubating female on 5 May, but the nest was empty on 8 May and the lining had been disturbed.

Breeding attempt 2. The same nest contained no eggs on 12 May. The nest had been relined (including a few fresh feathers) by 15 May, when it contained two fresh eggs. The nest contained four eggs on 19 and 22 May and three eggs on 25 May. The nest was torn down when I found it on the ground below the buttonbush on 31 May.

Breeding attempt 3. I found a newly completed empty nest at the edge of the copse on 2 June. The nest contained one egg on 5 June, yet on 9 June one egg was buried in the nest which had been torn and tilted. The pair of kingbirds did not attend the nest.

Breeding attempt 4. I found another newly completed empty nest in another isolated tree (50 m from the copse) on 13 June. The nest contained 2 eggs on 17 and 20 June, but was empty on 24 June.

Breeding attempt 5. The last new nest was built in yet another isolated shrub (65 m from the copse; 20 m from the tree of nest attempt number four). The nest was three-quarters finished on 24 June. On 28 June, the nest contained one egg, and two eggs from 2-7 July. The nest was empty on 11 July.

The pair of Eastern Kingbirds remained on territory (now centered on the copse) through at least 27 July, although no further nesting attempts ensued. All five attempts failed because of predation on eggs during the incubation stage (cf., Murphy 1983b), with three of five nests failing before half the incubation period of 14 days (in Kansas: Murphy 1983b) had elapsed. A possible predator was the Fish Crow (*Corvus ossifragus*), which decimated a colony of Boat-tailed Grackles (*Quiscalus major*) that nested in the copse (McNair and W. W. Baker pers. obs.).

Eastern Kingbirds have a prolonged period (about 3 weeks) between time of their arrival on territory and initiation of the first clutch, in both warm and cold climates (Murphy 1983a,b; Blancher and Robertson 1985, this study). In colder climates, the breeding season (first egg-laying dates) begins mid- to late-May and usually continues through early July, rarely to mid-July. In Florida, the breeding season may continue beyond mid-July (Stevenson and Anderson 1994), but begins earlier, in extreme late April and early May (Stevenson and Anderson 1994, this study). Despite intense predation, repeated breeding failure, and the rather limited availability of suitable nest-sites, the persistent pair of Eastern Kingbirds in Florida demonstrated strong site fidelity (Blancher and Robertson 1985, Murphy 1996).

Although the pair of Eastern Kingbirds in Florida was unmarked, I believe it is unlikely that either mate may have been replaced (cf., Peck 1984). The most conservative measure of the maximum time between the disappearance of one clutch and the appearance of the first egg of the next clutch ranged from 8-11 days, which is not inconsistent with the mean time of almost six days between nest completion and the initiation of egg-laying of Eastern Kingbirds in Kansas and New York (Murphy 1983b). Thus, I have no compelling evidence from the four inter-clutch intervals that the pair of Eastern Kingbirds in Florida had a slower transition to egg-laying, which is the rule for new pairs (Murphy 1996). The short time intervals between active nests probably precludes the possibility of mate replacement for the pair in Florida. Furthermore, the isolated site, proximity of nests, and presence of a pair of Eastern Kingbirds on territory for a considerable period after the last breeding failure also suggests that a mate was not replaced.

Finally, Eastern Kingbirds rarely have been documented to reuse nests between years (Blancher and Robertson 1985, Bergin 1997), although this probably occurs more often than realized (see Bergin 1997). Breeding attempts number one and two of the pair of Eastern Kingbirds in Florida also confirms that they may reuse nests within a year, although in this case the time interval between the disappearance of one clutch and the laying of the next clutch was apparently not shortened.

In summary, one apparent pair of unmarked Eastern Kingbirds at Lake Jackson, Florida, attempted to breed five times in one season, the maximum number ever documented. All nesting attempts failed during the incubation stage. The larger maximum number of nesting attempts corresponds to a longer breeding season in Florida, compared to other studies.

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AERIAL FORAGING BY TRICOLORED HERONS, SNOWY, AND GREAT EGRETS

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Tricolored Herons (*Egretta tricolor*) and Snowy Egrets (*E. thula*) are intermediate-sized herons that forage actively, are opportunistic in exploiting ephemeral food resources, and exhibit behavioral plasticity (Toland 1999). Great Egrets (*Ardea alba*) are larger and use a less active approach in their foraging, often remaining motionless for extensive periods as they forage. Most foraging of Tricolored Herons and Snowy Egrets is done in shallow water, but both species will occasionally take prey by aerial feeding in water that is too deep for them to wade (Kushlan 1976). Great Egrets commonly forage in deeper water, but also occasionally take prey from flight (Kushlan 1976). Aerial feeding has been described as a number of distinct foraging behaviors that include: "Hovering," where a heron hovers over a spot and reaches down with it bill to seize prey (Grimes 1936, Jenni 1969); "Hovering-stirring," where the heron stirs water or debris with a foot with legs dangling (Meyerriecks 1959, Sprunt 1936); "Dipping, "where the heron continues in direct flight while capturing prey from the water (Dickinson 1947), and "Foot-dragging," where the heron drags its toes through the water while catching prey during direct flight (Kushlan 1972). Dipping or Hovering has been recorded for many heron species (Kushlan 1976) and is often associated with taking dead or injured fish (Reese 1973, Rodgers 1974, 1975). We report here on additional observations of Tricolored Herons and Snowy Egrets and Great Egrets using Dipping and Foot-dragging methods in foraging and assess the overlap of Dipping, Hovering, and Foot-dragging foraging behaviors.

On 12 March 1997 from about 0900-1000, we were walking along Anhinga Trail in Everglades National Park in south Florida. The elongate pool along the trail narrows to 2-3 m, and has emergent vegetation along both sides with occasional vegetation emerging from the open water. WED saw two Tricolored Herons make 2-3 m flights from one side of the water body to the other, alighting on low perches on either side. The birds flew low over the water and usually, with legs and feet partially dangling but not touching the water, paused in flight and stabbed at the water surface to seize 3-4 cm fish (probably *Gambusia* sp.). This pause in the bird's direct flight was sometimes accompanied by hovering for 2-3 wingbeats. One heron caught one fish on one attempt, the other caught 2 fish in 6 attempts. The second bird also hover-gleaned an unidentified prey item from emergent vegetation. JAJ independently observed three Tricolored Herons performing the same maneuvers. Two birds each caught a fish in single attempts, the third bird caught six fish in six attempts. Two of the three herons were probably the same birds recorded by WED. The total of 16 attempts resulted in 12 captures (75%). Flights were all 2-3 m from one perch to another and Dipping was accompanied by very little hovering.

On 11 March 1999 WED witnessed Dipping behavior by eight Snowy Egrets and a Tricolored Heron foraging at the J. N. "Ding" Darling National Wildlife Refuge on Sanibel Island, Florida. At the junction of Cross Dike and Indigo Trails, the waterway makes a right-angle turn and varies in width from 7-12 m. Mangroves line both shores except for one stretch cleared of vegetation along the dike. Two floating platforms, about 1 × 1.5 m,

containing mangrove seedlings were anchored about mid-stream. From about 0750-0800 eight Snowy Egrets flew back and forth between perches on mangroves, from one shore to another, from one of the floating platforms to shore, or from mangrove perches to the limestone-sand shoreline. Sometimes a bird sallied forth from a platform or mangrove perch and returned to its original perch. Typically an egret flew close to the water surface in slow direct flight with legs dangling, often with feet dragging in water, and attempted to seize a fish at the surface by lowering its head and stabbing with its bill. One to three prey-capture attempts were made per direct flight. In some flights a bird dragged its feet constantly, in some forays it dragged its feet only immediately before attempting prey capture, and in a few cases a bird did not drag its feet. There was no hovering. The situation was chaotic, a frenzy of activity, with several birds Dipping or Foot-dragging at the same time. It was not possible to determine a success rate for prey capture but several observations were made of egrets bringing ashore approximately 5-cm fish before swallowing them. Only once did a Tricolored Heron leave the shore and unsuccessfully try to capture prey by Dipping. At about 0800 the herons dispersed and further Dipping behavior was not seen.

On 9 March 2000 at 10:35, JAJ observed a Great Egret at Corkscrew Swamp Audubon Sanctuary as it flew from a barely emergent stump, dipped into the water with its bill in an unsuccessful effort to seize a small fish, then returned to its original perch. Its feet dangled to near the water, but only once barely touched it.

Kushlan (1972) associated the use of aerial foraging by Tricolored Herons and Snowy Egrets with lowered prey availability. Our observations suggest that the birds were simply opportunistic and availed themselves of surface prey. At Anhinga Trail and Corkscrew Swamp, water levels were seasonally low, concentrating prey that were easily observed by us.

McIlhenny (*in* Dickinson 1947) observed Tricolored Herons and Snowy Egrets ". . . swoop down and hover for a moment, darting" the head underwater to seize a twig that could be used in nest-building. This behavior appears to fall between Hovering and Dipping, since the herons "hover for a moment," but is marginally relevant since it did not involve prey capture. Dickinson (1947), however, reported observations of 50-60 Snowy Egrets Dipping and taking fish prey while circling over open water of a lake. Fargo (1937) reported Snowy Egrets Dipping while flying back and forth across a 7-m-wide ditch. Rogers (1974) reported multiple observations of Snowy Egrets Hovering (often with legs dangling and feet submerged). He (1975) also observed Hovering by Tricolored Herons. In both cases the birds were feeding on dead or dying fish. Jenni (1969) reported Tricolored Herons and Snowy Egrets "flying low over the water, or hovering and reaching down into the water to grasp prey in the bill." We believe that Hovering and Dipping are associated behaviors—extremes of a behavioral continuum. The Tricolored Herons we watched occasionally hovered momentarily when taking live, active prey but mostly maintained direct flight. The Snowy Egrets foraged by Foot-dragging and Dipping but did not hover. Reports of Hovering often are associated with retrieving dead, dying, or highly concentrated prey, where possibilities of escape are low and hovering before striking is therefore a viable option. We suggest that Dipping and Hovering are variations on the same foraging theme, and that the escape potential of the prey determines which foraging behavior is practiced. Foot-dragging may or may not be included in the aerial foraging repertoire of birds feeding at the same time, and thus the function of foot-dragging remains problematic. It may serve to startle prey into movement or simply be an artifact of slow direct flight with feet dangling for balance. We suggest other possible functions: dragging the feet would slow forward momentum and could also steer and stabilize motion—like the rudder on a boat—thus steadying the bird and facilitating prey capture.

A study by E. A. Chapin (unpublished records of the Bureau of the Biological Survey from analysis of stomach contents of birds collected from diverse coastal areas of the

U.S.; cited in Howell 1932) revealed that killifish were a frequent food of Tricolored Herons, being found in 38 of 48 stomachs. Other studies which examined regurgitated boluses from nestlings, also revealed a preponderance of killifish and topminnows in Tricolored Heron and Snowy Egret diets (Jenni 1969, Frederick 1997). These primarily surface-feeding fish would be especially vulnerable to aerial foraging. The presumed prey of the Tricolored Herons, *Gambusia*, were clearly visible at the sites of our observations, and surface feeding fish were clearly the prey of Snowy Egrets at Sanibel Island.

Although Kent (1987) found that Tricolored Herons had a greater striking efficiency when walking slowly than with more active foraging, our observations suggest that aerial foraging can be very efficient. Kent (1987) also noted that the foraging behavior that resulted in the greatest striking efficiency may not be the behavior most often used. Clearly, the best mode of foraging may vary with individual abilities, microhabitat, prey availability, potential predators, lighting, and wind conditions. In the case we observed for Dipping Tricolored Herons at Everglades National Park, prey were easily available, in good light with no wind, and the shoreline provided numerous perches on opposite sides of a narrow water body. We suspect that the presence of numerous patrolling alligators at Anhinga Trail and at Corkscrew Swamp may have made aerial foraging a less hazardous option than wading or perching on emergent vegetation in open water. The Sanibel Island birds appeared to be momentarily exploiting an ephemeral surface prey in water too deep for wading.

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A KLEPTOPARASITIC ATTACK ON A DOUBLE-CRESTED CORMORANT BY A BROWN PELICAN

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Kleptoparasitism, or the stealing of resources, has been observed within and between many bird species (Brockmann and Barnard 1979, Furness and Monaghan 1987). Although the kleptoparasite sometimes steals food without aggression towards the host, the host may be threatened or even attacked (Brockmann and Barnard 1979). In this note, I report a case of kleptoparasitism in which the host was violently attacked.

I observed an attack by a Brown Pelican (*Pelecanus occidentalis*) on a Double-crested Cormorant (*Phalacrocorax auritus*) next to the public fishing pier at Cedar Key, Levy County, Florida, at 1450 EST on 16 January 2000. As I watched with 10× binoculars from approximately 15 m, the cormorant, foraging alone, surfaced with a 20 to 25 cm spotted seatrout (*Cynoscion nebulosus*) in its mouth. The posterior half of the fish protruded from the cormorant's mouth as the bird held its head vertically for 10 to 15 s, but the cormorant failed to swallow the fish. The pelican, which had been sitting on the pier with several others, suddenly dived onto the cormorant and engulfed the protruding fish and the cormorant's bill, head, and neck. The cormorant struggled to escape from the pelican's bill for approximately 10 s and finally broke free without the fish, briefly remaining within 1.5 m of the pelican. The cormorant shook its head side-to-side, dived, resurfaced nearby, and shook its head again, perhaps reacting to the effects of the attack. During the next several min, it swam slowly away from the pelican and repeatedly dived. After each return to the surface, the cormorant shook its head. Continuing this behavior of slow swimming, diving, and head shaking, the cormorant moved several hundred m from the pier in about 20 minutes, at which time my observations ended.

American White Pelicans (*Pelecanus erythrorhynchos*) are known to steal food from Double-crested Cormorants (Anderson 1991), sometimes after holding the cormorant's head underwater until the food is released (O'Malley and Evans 1983). Although the Brown Pelican is known to steal food from gulls (Sefton 1950), nothing approaching an outright attack by this species has been previously reported. However, Francis's (1981) discovery of a dead Brown Pelican with a dead Double-crested Cormorant in its pouch indicates a violent attack may have taken place.

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ATTEMPTED HETEROSPECIFIC KLEPTOPARASITISM BY CRESTED CARACARAS OF OSPREYS

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Kleptoparasitism, the stealing of already procured food from hetero- or conspecifics, is disproportionately represented by certain orders of birds that includes the Falconiformes (Brockmann and Barnard 1979). Kleptoparasitism reduces the difficulties associated with finding profitable prey, but requires that birds attack vulnerable species and successfully outmaneuver their victims to procure food (Brockmann and Barnard 1979, Gochfeld and Burger 1981).

Crested Caracaras (*Caracara plancus*) have been documented to kleptoparasitize conspecifics, other raptors, and some other species, especially vultures and wading birds (Hamilton 1981, Palmer 1988, Rodriguez-Estrella and Rivera-Rodriguez 1992, Morrison 1996; M. A. McMillian, unpubl.; J. L. Morrison, unpubl.), but successful or attempted kleptoparasitism of an Osprey (*Pandion haliaetus*) has not been documented in the published literature. M. A. McMillian and L. M. Rojas watched a juvenile caracara chase an Osprey that was carrying a fish, in what was probably an attempt by the caracara to kleptoparasitize the Osprey. This observation occurred at 1030 hr on 25 March 2000 along the southern shore of Lake Istokpoga, Highlands County, Florida. Initially, two juvenile caracaras flew out over Lake Istokpoga, 50-75 m from shore. One caracara immediately flew back to the shoreline but the other bird began chasing an Osprey, which was carrying a fish. The chase occurred over water in an area that contained seven Osprey nests, all within 125 m of each other. The Osprey performed 2-3 very sharp left and right turns, then dove towards the water. The juvenile caracara was above and behind the Osprey, but broke off the chase once the Osprey was near the water. On two occasions during the short chase (40-50 m), the juvenile caracara attempted to hit the Osprey with its talons presumably to force the Osprey to drop the fish, but was unsuccessful.

DBM watched an adult caracara chase an adult Osprey in what again was probably an attempt to kleptoparasitize the Osprey. This observation occurred at 0720 hr on 30 March 2000 along Istokpoga Canal, Highlands County. The Osprey was flying at treetop level along the canal, 200 m west of the bridge on state road 621. It carried a fish in its talons and was calling, probably to its mate, which was some distance from the canal. An adult caracara, which had fed a begging juvenile caracara on the road near the bridge ten minutes before, swooped down on the Osprey from just above and behind and chased it for about 100 m. The Osprey, calling several times, dipped down toward the water, then flew upward in a half-circle, the caracara just behind and slightly underneath it. The caracara was silent and never lowered its talons or touched the Osprey. Finally, the Osprey perched in the top of a large live oak (*Quercus virginiana*) along the canal, the caracara perched 30 m away in an adjacent live oak, and the chase temporarily ceased. After 10 sec, the chase resumed when the Osprey left its perch. A second Osprey came within 100 m, but never interfered in this second chase. This chase was similar, but shorter, than the first. After the Osprey again dipped down toward the water and rose and left the canal, the caracara broke off the chase. The Osprey, which had never dropped the fish, continued flying over adjacent cattle pastures and woods.

The behavior of both caracaras that chased these Ospreys that were carrying fish was similar to the behavior of Crested Caracaras in Baja California that twice pursued single Red-tailed Hawks (*Butco jamaicensis*) that carried large intact prey, but in neither case did the hawk drop its prey (Rodriguez-Estrella and Rivera-Rodriguez 1992). In south Texas (Hamilton 1981), a Crested Caracara successfully kleptoparasitized intact prey from a Northern Harrier (*Circus cyaneus*). This caracara did not force the harrier to regurgitate prey (cf., Bent 1938, Glazener 1964). Hamilton (1981) also stated this caracara remained silent throughout its chase and did not touch the harrier, similar to our observations of both caracaras that chased Ospreys. Thus, based on aggressive behavior of caracaras toward Red-tailed Hawks and evidence of successful kleptoparasitism of Northern Harrier and other large raptors (Palmer 1988, Rodriguez-Estrella and Rivera-Rodriguez 1992), we believe that both of our caracaras were attempting to kleptoparasitize these Ospreys. Furthermore, M. A. McMillian has observed caracaras to successfully kleptoparasitize intact fish from Ospreys at least five times in the Lake Istokpoga region over the last 10 years, but he did not record details for these observations.

Solicitation of food by the juvenile caracara may have stimulated the adult caracara to chase and probably attempt to steal food from the Osprey along Istokpoga Canal. Morrison (1996) stated that kleptoparasitism by Crested Caracaras is common. Kleptoparasitism of Ospreys by caracaras would be expected of an opportunistic predator with a generalist diet (Brockmann and Barnard 1979, Morrison 1996 and references cited therein). Thus, although kleptoparasitism of Ospreys by caracaras has been undocumented before, this behavior has probably been overlooked. Ospreys are abundant in Florida including the region around Lake Istokpoga where their distribution overlaps with Crested Caracaras. Ospreys may be more vulnerable to kleptoparasitism by caracaras during the breeding season when Ospreys are bringing food to young or their mate. Regional differences in kleptoparasitism may exist among Crested Caracara populations because of differences in abundance of susceptible species, especially in Florida where caracaras are locally distributed (Morrison 1996 and references cited therein).

In summary, Crested Caracaras probably attempted to steal food from two Ospreys in Florida, which had not been documented before at any geographic locality.

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PURSUIT AND CAPTURE OF A RING-BILLED GULL BY BALD EAGLES

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Bald Eagles (*Haliaeetus leucocephalus*) are opportunistic hunters that employ a number of techniques to capture a wide variety of prey (Bent 1937, Brown and Amadon 1968, Sherrod et al. 1976, McEwan and Hirth 1980). These eagles are known to occasionally pursue prey, including flying birds, in pairs or larger groups (McIlhenny 1932, Sherrod et al. 1976, Folk 1992). Here we report three Bald Eagles giving a prolonged chase of a Ring-billed Gull (*Larus delawarensis*), which resulted in the gull's capture by one of the eagles.

At approximately 1500 on 12 December 1998, we were kayaking east across Newnan's Lake in eastern Alachua County, Florida, when we noticed a group of approximately 50 Ring-billed Gulls sitting on the water near the center of the lake. As we approached to approximately 100 m, the gulls lifted off when an adult Bald Eagle flew toward them at a height of about 75 m. The eagle immediately started to chase a first-winter individual. The chase was linear at first, but the gull evaded the faster flying eagle with sharp turns. Over the next three minutes, the eagle continued to chase the gull with rather slow stoops from heights of 25-100 m followed by short, fast linear pursuits. None of the stoops or pursuits was close to being successful. The other gulls had scattered at least 500 m away while the chase continued.

The pursuing eagle was then joined by another adult eagle, and both used slow stoops from above, followed by short linear pursuits. The gull continued to evade the two eagles over the next minute but had less recovery time between stoops. The two eagles were then joined by a third adult eagle. With three birds in pursuit, the gull was having a more difficult time evading the pursuits, because the eagles were often simultaneously stooping from above and chasing from behind. The gull changed directions several times to evade capture. The chase by the three eagles of the gull continued for 10 minutes westwards across the lake, then one eagle approached the gull from behind and the gull made an upward evasive maneuver. Another eagle, which had been circling approximately 50 m above, made a short (<10 m) downward stoop and captured the gull in its talons. This eagle then flew fast and straight to the edge of the lake and out of view, presumably to consume the prey. The other two eagles did not pursue the eagle with the prey.

At no time did the gull attempt to avoid capture by landing on the surface of the water. None of the eagles ever attempted to chase any other gull during the approximately 20 min of observation. Obviously, an eagle has an advantage over gulls if the prey is either on the water, when eagles can stoop from above (e.g., Bent 1937 and see below), or in linear chases, where eagles are faster fliers. The only means of escape for the gull is for it to use its greater agility to avoid capture until the eagle tires of the chase. When more than one eagle joins the chase, the gull's advantage of agility and endurance diminishes. The gull appeared healthy, as it flew normally and was not noticeably lacking in agility or speed.

Flocks of gulls, composed mostly of Ring-billed and Bonaparte's (*L. philadelphia*), but often including some Laughing (*L. atricilla*) or Herring (*L. argentatus*) gulls, have been increasing in size in recent years at Newnan's Lake (R. Rowan pers. comm.). Bald Eagles are also common and increasing at Newnan's Lake (pers. obs.).

Fully-grown gulls appear to be only an occasional item in the diet of the Bald Eagle (see summaries in Bent 1937, Stalmaster 1987, and Gerrard and Bortolotti 1988). Southern populations of the eagle subsist largely on fish (Bent 1937), although birds may also make up a large proportion of the prey (McIlhenny 1932, Folk 1992). In north Florida, McEwan and Hirth (1980) found that fish comprised 70% of dietary biomass at 16 Bald Eagle nests. They found only one gull (a Ring-billed) among 788 identified prey remains. In that study, the most common bird by far was the American Coot (*Fulica americana*), which comprised an estimated 19% of the biomass in the diet, eight times more than any other bird species. In central Florida, a Bald Eagle took a first-year Ring-billed Gull over-summering at Zellwood Farms in central Florida (H. Robinson *in* Pranty 2000). Northern populations of Bald Eagles may prey upon gulls to a greater extent. At eagle nests in Alaska, Murie (1940) found that Glaucous-winged Gulls (*L. glaucescens*) were commonly taken, although the age of the gulls was not given. In Washington, breeding eagles commonly took Glaucous-winged Gull chicks, but older gulls capable of flight were not taken (Hayward et al. 1977). In Maine, an adult eagle stooped and captured an adult Ring-billed Gull just as it was rising from a flock resting at a tidal pool (D. B. McNair *in litt.*). Adult Bald Eagles apparently have greater success at attacking flying prey than young eagles, which rely to a greater extent on injured prey or carrion (Sherrod et al. 1976). All three eagles giving chase in our observation were adults.

Pairs or larger groups of Bald Eagles have been noted to pursue and capture rabbits (Edwards 1969), geese (McIlhenny 1932), auklets (Sherrod et al. 1976), and egrets (Folk 1992). Although many of these groups may have been opportunistic rather than cooperative aggregates of individuals, Folk (1992) reported four instances of a pair of nesting Bald Eagles pursuing and capturing Cattle Egrets (*Bubulcus ibis*) in cooperative tandem hunts, with one eagle chasing and one eagle stooping. Although the behavior of eagles observed by us was similar, it is more likely that these three eagles were acting opportunistically, as several minutes elapsed before the other eagles joined the chase. Cooperative hunting is generally rare within the order Falconiformes, being notably developed only in Harris's Hawk *Parabuteo unicinctus* (Mader 1975, Ellis et al. 1993) and Eleonora's Falcon *Falco eleonora* (Walter 1979).

In our observation, three Bald Eagles pursued an immature Ring-billed Gull until one of the eagles captured the gull. Such hunting tactics suggest that Bald Eagles may opportunistically employ group hunting, especially when they choose relatively agile prey, such as gulls. Bald Eagles are not known to hunt in groups for prey such as fish and coots, which are frequent in their diet in the southeastern United States (i.e., McEwan and Hirth 1980).

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COYOTE DISTRIBUTION IN FLORIDA EXTENDS SOUTHWARD

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The presence of the coyote (*Canis latrans*) has been confirmed in 65 of Florida's 67 counties (Fig. 1). Florida's two southernmost counties, Dade and Monroe, were the only counties in the state where no confirmed sightings of coyotes have as yet been documented (T. Regan, Florida Fish and Wildlife Conservation Commission, pers. comm., 2000; S. Bass, Everglades National Park, pers. comm., 2000). The southernmost confirmed observation of coyotes in Florida was provided from a carcass collected on the Fakahatchee Strand State Preserve (M. Owens, Florida Department of Environmental Protection, pers. comm., 1998; Fig. 1).

Coyotes have increased their range throughout Florida during the last 30-40 years. Range expansion of coyotes from Alabama and southern Georgia resulted in confirmed reports of coyotes in northern Florida during the 1960's and established populations were documented in the Panhandle and northern region of the state by the late 1970's (Layne 1994). Since then coyotes have extended their range southward into peninsular Florida. Although several intentional introductions of small numbers of coyotes by hunting groups were documented (Layne 1994), it is unclear how important these introductions were to the spread of coyotes throughout the state. Assuming the increase of coyotes in Florida resulted primarily from a natural range expansion southward into Florida during the 1960's, widespread establishment of coyotes throughout Florida took roughly 30 years, with the rate of spread increasing rapidly during the last decade.

A systematic approach to determining coyote distribution in Florida was initiated by Brady and Campbell (1983), who documented the coyote in 18 counties via a mail survey, primarily in the Panhandle (Fig. 1). Wooding and Hardisky (1990) conducted a similar survey and reported the presence of coyotes in 31 additional counties (Fig. 1). A survey for coyote sign conducted in four southern Florida counties indicated coyotes were becoming well established in southern Florida by the mid-1990's (Maehr et al. 1996). During 1997 an annual scent (track) station survey was initiated at over 30 locations located primarily in south-central Florida in an effort to further document and monitor the continued expansion of coyote populations (Main et al. 1999). Additional documentation of the distribution of coyotes in Florida was obtained during 1997-98 from carcasses collected throughout the state by ranchers, University of Florida Cooperative Extension Agents, and others for a pathogen and parasite study being conducted in cooperation with the University of Florida College of Veterinary Medicine (Main and Coates 2000). The presence of coyotes in Lee County in southwest Florida was confirmed by personal observation (M. Main pers. obs., 1998). We contacted biologists from the Florida Fish and Wildlife Conservation Commission (FWC) and inquired as to whether they could reliably confirm the presence of coyotes in counties from which we had no confirmed reports. In this manner we confirmed the presence of coyotes in the northeastern counties of Baker and Duval (J. Norment, FWC, pers. comm., 2000), St. John's and Volusia counties in central Florida (D. Coyner, FWC, pers. comm., 2000), Pinellas,

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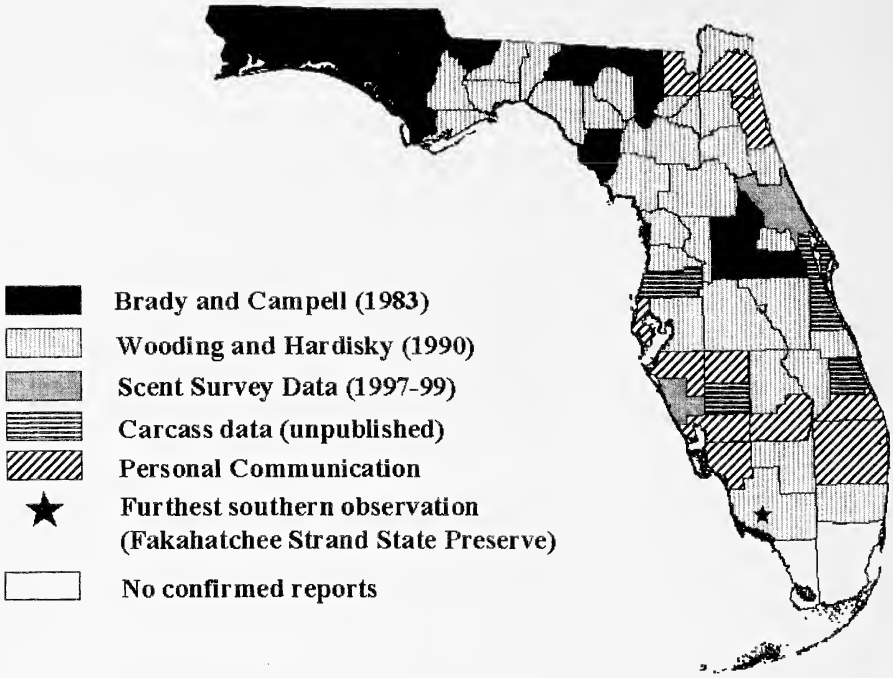

Figure 1. Distribution of coyotes in Florida based on published surveys, reports, and unpublished data, including personal communication (see text for description of sources).

Glades, and Hardee counties in south-central Florida (J. McGrady, FWC, pers. comm., 2000), and St. Lucie, Martin, and Palm Beach counties in southeastern Florida (T. Regan, FWC, pers. comm., 2000). We combined information from all sources and composed a new distribution map portraying range expansion of the coyote throughout Florida (Fig. 1). These data indicate coyotes are established throughout the state and that range expansion of coyotes throughout Florida took approximately three decades.

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CHANGE OF EDITOR

Effective with this notice, all manuscripts submitted for possible publication in the Florida Field Naturalist shall be sent to: Dr. Jerome Jackson, Professor, Whitaker Center, College of Arts and Science, Florida Gulf Coast University, 10501 Florida Gulf Coast University Boulevard South, Fort Myers, Florida 33965-6565; Ph: (941) 590-7193; FAX: (941) 590-7200; E-mail: JJACKSON@FGCU.EDU.

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FIELD OBSERVATIONS

Spring Report: March-May 2000. The observations listed here are reports of significant birds or numbers of birds reported to the Field Observations Committee (FOC). Reports submitted to the Committee should be in the following format: species, number of individuals, age and sex of the bird(s), color morph if applicable, location (including county), date, observer(s), and significance. Reporting seasons are winter (December-February), spring (March-May), summer (June-July), and fall (August-November). Submit reports to regional compilers within two weeks after the close of each season, or to the state compiler within one month. Reports sent via e-mail are greatly preferred over those sent via regular mail. Addresses of the FOC members are found at the end of this report.

Sight-only observations are considered "reports" while only those supported by verifiable evidence (photographs, video or audio tapes, or specimens) are called "records." Species for which documentation is required by the FOS Records Committee (FOSRC) are marked with an asterisk (*). A county designation (in italics) accompanies the first-time listing of each site in this report. Abbreviations used are: CP = county park, EOS = end of season, DTNP = Dry Tortugas NP (*Monroe*), FDCP = Fort DeSoto CP (*Pinellas*), FWBSTF = Fort Walton Beach STF (*Okaloosa*), LARA = Lake Apopka Restoration Area (*Orange* unless specified), NWR = national wildlife refuge, PPM =Polk phosphate mines, SMNWR = St. Marks NWR (*Wakulla*), SP = state park, SRA = state recreation area, SRSTF = Springhill Road STF (*Leon*), STF = sewage treatment facility, TISP = Talbot Island SP (*Duval*), and N, S, E, W, etc., for compass directions. Bold-faced species denote birds newly reported or verified in Florida.

Summary of the Spring Season

Once again, Florida was crippled by severe drought, the worst on record in some areas. Typical rainfall from January through May is compared with the first five months of 2000 (all measurements in inches) for selected cities follows: Tallahassee: 25.03 and 8.44, Tampa: 12.17 and 3.12, and Miami: 15.51 and 10.74. The effects of the drought were most severe in central Florida; where hundreds or thousands of shallow wetlands dried up completely, and lakes were much reduced. Decreased water levels attracted concentrations of wading birds and shorebirds, especially at Newnans L., which recorded its lowest water level in over 60 years. Other impressive shorebird counts came from L. Hollingsworth in Lakeland and L. Jackson at Tallahassee. Fortunately, rainfall in Jun and Jul broke the drought, and surface water is beginning to return to most areas.

Strong west winds over a period of many days in late April caused fallouts of birds virtually statewide. Wally George called the number migrants in Broward County during 22-26 April "astonishing" and "incredible," with hundreds of wood-warblers per hour moving north through Birch State Park in Fort Lauderdale. Primary species involved were Northern Parulas, Blackpoll, Black-throated Blue, Cape May, and Black-and-white warblers, American Redstarts, and Common Yellowthroats. On 30 April, John Boyd watched a similar spectacle of Black-throated Blue, Cape May, and Blackpoll warblers, American Redstarts, and Common Yellowthroats streaming through Cape Florida near Miami. Boyd estimated at least 1000 wood-warblers per hour for close to four hours.

Along the Gulf coast, fallouts were was noted at Cedar Key 22-26 April and at Fort DeSoto County Park from 22-27 April, with 25 species of wood-warblers on 25 April. Swainsons Warblers were particularly numerous in Pinellas County. At Newnans Lake near Gainesville, the drought resulted in the lowest recorded water level since the 1930s, and created ideal shorebird habitats; during this spring, 26 shorebird species were found at Newnans Lake, which equaled the entire Alachua County shorebird list

for the previous 113 years! Not surprisingly, Rex Rowan called this spring the "best on record." Drought conditions and a drawdown of L. Hollingsworth in Polk County also created ideal shorebird habitat and some amazing spring shorebird counts. Gail Menk reported that the drought also dried up L. Jackson at Tallahassee, which attracted significant numbers and species of shorebirds. In the western Panhandle, Bob Duncan called the spring migration "exceedingly slow" except for the fallout of 24 April. However, many outstanding rarities, including the region's first Curlew Sandpiper, were reported.

FOSRC rarities reported this spring were the Yellow-nosed Albatross off Tarpon Springs, the White-faced Ibis at Fort Walton Beach, three Rough-legged Hawks and the Cassin's Kingbird that remained at Lake Apopka from the winter, two Vaux's Swifts at Fort Pickens, the Calliope Hummingbird at Pensacola, the Tropical/Couchs Kingbird at Fort De Soto, Bewick's Wrens at Fort Walton Beach and Lake Apopka, the Bicknell's Thrush at Lake Apopka, and the Yellow-faced Grassquit at Dry Tortugas National Park. Among other interesting sightings were the White-faced Whistling-Duck at Lake Apopka, the Philippine Duck—Florida's most recent exotic at Pembroke Pines—the first Whooping Cranes to produce chicks, Fork-tailed Flycatchers at Boot Key and Dry Tortugas, and two each of La Sagra's Flycatchers and Bahama Mockingbirds in southern Florida.

Lastly, we welcome Charlie Ewell to FOS Field Observations Committee as regional compiler for Southwest Florida.

Species Accounts

Red-throated Loon: 1 at Gulf Breeze (*Santa Rosa*) 19 Mar (B., L., and W. Duncan).

Pacific Loon: 1 at Fort Pickens (*Escambia*) 16 Mar-13 Apr (B. and L. Duncan et al.).

Common Loon: 1 at Gainesville (*Alachua*) 8 Mar (A. Kratter); 4 at Lake Arietta (*Polk*) 22 Mar (L. Albright); a flock of 14, with several in breeding plumage, off Blue Mountain Beach (*Walton*) 17 May (T. Striker); 2 at Port Richey (*Pasco*) 21 May (K. Tracey).

Eared Grebe: 1 at PPM 1 Apr (P. Timmer, C. Geanangel, D. McNair).

*Yellow-nosed Albatross: 1 bird 50 km W of Tarpon Springs (*Pinellas*) 1 May (R. Powell, photo to FOSRC, *fide* G. Woolfenden).

Audubon's Shearwater: 400 between DTNP and Key West, including 300 in a single flock, 21 Apr (P. Lehman et al.).

White-tailed Tropicbird: 1 at DTNP 5-6 May (B. Cooper, K. Radamaker, K. Knight et al.).

Masked Booby: 45 at Hospital Key, including at least 3 chicks in Apr (P. Lehman et al.).

Northern Gannet: 100s at FDCP 4 Mar (E. Haney et al.); 1 at Passage Key NWR (*Manatee*) 23 May (R. Paul, A. Schnapf et al.).

American White Pelican: present throughout the season at Newnans Lake (*Alachua*), with 162 on 10 Mar (A. Kent et al.); 9 over Conch Key (*Monroe*) 26 Apr (P. Lehman et al.); 120 at Brandon (*Hillsborough*) 28 Apr (E. Kwater); 45 over Fort Walton Beach (*Okaloosa*) 18 May (T. Striker); 200 at Loughman Lake (*Brevard*) 27 May (C. Pierce, C. Paine); 15 at LARA 30 May (H. Robinson).

Brown Pelican: singles at LARA 2 and 13 May (H. Robinson); up to 5 at Newnans Lake 7-13 May (L. Davis, R. Rowan et al.).

Anhinga: 66 over TISP 21 Apr (P. Leary).

American Bittern: 5 at Orlando Wetlands Park (*Orange*) 2 Mar (D. Freeman); 2 at Lake Munson (*Leon*) 6 Mar (M. Hill); 1 at LARA to 2 May (H. Robinson).

Great Blue Heron × Great White Heron: 1 mixed brood at Bayshore Gardens, Bradenton 11 Mar (R. Paul).

Great White Heron: 2 at Newnans Lake 9-30 May (J. Hintermister et al.).

*White-faced Ibis: 1 adult in near-breeding plumage at FWBSTF 26 Apr (B. Duncan, details to FOC).

Roseate Spoonbill: 29 at PPM 23 Mar (P. Fellers et al.); up to 8 at Newnans Lake 16 Apr-EOS (M. Jones, R. Rowan et al.).

WOOD STORK: a new colony of about 12 pairs at Seven Springs (*Pasco*) 19 Apr (K. Tracey); 250 at Lake Jackson (*Leon*) 25 Apr (G. Menk); a new colony of about 12 pairs at NW Lake Disston (*Flagler*) 30 Apr ff (A. Moore, S. Nesbitt et al.); 390 at Micanopy 13 May (M. Manetz).

GREATER FLAMINGO: 1 unbanded escapee near Alafia Bank (*Hillsborough*) 11 Mar and 29 May (R. Paul, A. Schnapf).

FULVOUS WHISTLING-DUCK: 86 at Emeralda Marsh Conservation Area (*Lake*) 24 Mar (P. May).

BLACK-BELLIED WHISTLING-DUCK: 12 in *Alachua* 29 Mar-EOS (H. Adams et al.); 42 at Bartow (*Polk*) 25 April (P. Fellers).

WHITE-FACED WHISTLING-DUCK: 1 at LARA 7 May (H. Robinson).

BLACK SWAN: 2 pairs at Lake Eola (*Orange*) 27 May, 1 with 5 young and 1 with 5 eggs 27 May (P. Bowen).

PHILIPPINE DUCK (*Anas luzonica*): 1 at Pembroke Pines (*Broward*) in late May or early Jun (K. and K. Schnitzius, photos to FOC) had been seen sometime in Apr (L. Manfredi). The species is endemic to the Philippines.

GREEN-WINGED TEAL: 676 at LARA 3 Mar and 1 there to 13 May (H. Robinson).

AMERICAN BLACK DUCK: 1 at LARA to 30 May (H. Robinson).

BLUE-WINGED TEAL: 1 pair with 7 young at Air Products Sanctuary, Pace (*Santa Rosa*) 8 May (B. Milmore); 9 at Newnans Lake 27 May (L. Davis, R. Rowan); 2 at LARA to 30 May (H. Robinson).

NORTHERN SHOVELER: up to 8 at Newnans Lake 19-29 Apr (L. Davis, J. Hintermister et al.); 339 at PPM 25 Apr (P. Fellers et al.); 1 at LARA to 30 May (H. Robinson).

GADWALL: 1 at PPM 13 May (P. Timmer); 1 at Gainesville 13 May probably was injured (B. Roberts, T. Taylor).

REDHEAD: 2 at Tierra Verde to 23 Apr (B. Pranty, L. Walton, C. Dermer).

COMMON EIDER: 1 male and 1 female at Port Canaveral (*Brevard*) remained through the spring (C. Pierce et al.).

LONG-TAILED DUCK: 1 female at Titusville (*Brevard*) 13 Apr (T. Fiorello).

HOODED MERGANSER: 1 at Newnans Lake 13-26 May probably was injured (R. Rowan, T. Hoctor).

SWALLOW-TAILED KITE: 1 at Temple Terrace (*Hillsborough*) 3 Mar (B. Ahern); singles at FDCP 22 Mar (A. Mason et al.) and 9 Apr (K. Holland); 11 at Orlando Wetlands Park 8 Apr (C. Pierce et al.); 1 at DTNP 18 Apr (P. Lehman et al.).

WHITE-TAILED KITE: 2 pairs attempted to nest at Buck Island Ranch (*Highlands*) in Mar, but a prescribed fire deterred one pair, and the other started a nest 15 Mar but abandoned it; the drought was blamed (M. McMillian); the fate of 1 nest at Three Lakes WMA (*Osceola*) was not known (T. Dean).

MISSISSIPPI KITE: 1 at S Jacksonville (*Duval*) 28 Apr-2 Jun, where birds were seen in 1994-1995 (J. Cocke).

BALD EAGLE: 1 adult over Key West (*Monroe*) 26 Apr (P. Lehman et al.); 1 adult over Boca Chica Key (*Monroe*) 12 May (G. Stoccardo, C. Read).

NORTHERN HARRIER: 124 at LARA 3 Mar and through the season (H. Robinson); a total of 63 at TISP during 26 Mar-25 Apr, with 33 on 21 Apr (P. Leary); 2 in *Alachua* 13 May (R. Robinson, T. Hoctor).

SHARP-SHINNED HAWK: a total of 123 at TISP during 26 Mar-25 Apr, with 90 on 21 Apr (P. Leary); 1 at LARA through the season (H. Robinson).

COOPER'S HAWK: 1 pair building a nest at Boyd Hill Nature Park, St. Petersburg (*Pinellas*) 6 Mar (*fide* R. Smith); 1 at DTNP 18-22 Apr (P. Lehman et al.); 1 female at Jupiter Inlet (*Palm Beach*) 25 May-20 Jun (J. and L. Hailman).

BROAD-WINGED HAWK: singles at Tallahassee 8 Mar (P. Conover) and 27 Mar (G. Menk); 1 at Turkey Creek Sanctuary (*Brevard*) through 23 Mar (B. and S. Hills et al.).

SHORT-TAILED HAWK: 1 light morph at Lettuce Lake CP (*Hillsborough*) 2 Mar (R. Webb); 1 dark morph at IMC/Peace River Park (*Polk*) 11 Mar (T. Palmer) and 23 Mar (P.

Fellers et al.); 1 pair courting over Crews Lake CP (*Pasco*) 28 Mar (D. Robinson); 1 at Cedar Key Scrub State Reserve (*Levy*) 16 Apr (C. Graham); 1 dark morph at Van Fleet State Trail in *Lake* 19 Apr and 15 May (B. and L. Cooper); 1 dark morph in *Hernando* 6 May (K. Nelson, P. Blair, L. Hopkins).

*Rough-legged Hawk: 3 at LARA to 11 Apr, and 2 there to 19 Apr (H. Robinson).

American Kestrel: a total of 279 at TISP during 26 Mar-25 Apr, with 151 on 26 Mar (P. Leary).

Merlin: a total of 171 at TISP during 26 Mar-25 Apr, with 83 between 1100-1800 hrs on 21 Apr (P. Leary); 1 at Newnans Lake 29 May (M. Manetz).

Peregrine Falcon: 1 at SRSTF 2 Apr (G. and S. Hampton); singles at Newnans Lake 29 Apr (J. Hintermister, M. Manetz) and 13 May (J. Bryan).

Black Rail: 1 at a phosphate mine 1 Mar (T. J. Coburn) and 2 at Kicco WMA 21 Apr (P. Fellers, T. J. Coburn) were the first *Polk* reports.

King Rail: 1 at SRSTF 21 May (J. Cavanagh).

Sora: 1 at Gainesville 11 May (R. Rowan); 1 at Santa Rosa Beach (*Santa Rosa*) 16 May (T. Striker).

Purple Gallinule: 1 at HISRA 11 Apr (W. Yusek); 1 at Tierra Verde 28 Apr-2 May (P. Blair, W. Yusek, R. Smith).

American Coot: 1 swimming on the ocean ca. 40 km WSW of Key West 21 Apr (P. Lehman et al.).

Whooping Crane: three pairs in *Osceola* laid eggs this spring, and one pair hatched two chicks 16 and 18 March. Unfortunately, one chick disappeared rather quickly and the other was killed by a bobcat within days of achieving flight (S. Nesbitt).

Black-bellied Plover: 3 at Newnans Lake to 26 Mar (A. Kent, L. Davis), and 1 there 2 May (R. Rowan); 75 at LARA 30 Apr and 8 there to 13 May (H. Robinson).

American Golden-Plover: 1 at SRSTF 27-28 Mar (G. and S. Hampton); 1 at the LARA sod farm 29 Apr (K. Radamaker, C. Pierce).

Snowy Plover: 6 birds (3 pairs) and 1 nest with 2 eggs at North Anclote Bar (*Pasco*) 17 May (R. Paul, A. Schnapf et al.).

Wilson's Plover: 1 at Cedar Key 7 May (T. Taylor).

Semipalmated Plover: present at Newnans Lake 17 Apr-EOS, with 100 there 29 Apr (J. Hintermister, M. Manetz et al.); 19 at Lake Jackson 25 Apr (G. Menk); 21 at LARA 26 Apr, and 12 there to 16 May (H. Robinson); 395 at TISP 3 May (R. Clark).

Piping Plover: 15 at Tigertail Beach, Marco Island (*Collier*) 21 Mar (K. Behrens); 2 at TISP 29 May (R. Clark).

American Oystercatcher: 60 off the Cross-Florida Barge Canal (*Citrus*) 28 Mar (T. Rogers); 1 at DTNP 17 Apr (P. Lehman et al.); 1 at Fort Pickens 20 Apr (L. Duncan et al.).

Black-necked Stilt: 1 at Crystal River (*Citrus*) 11 April (B. Smyth); 3 in central *Pasco* 12 Apr (B. Pranty); 1 at Lake Jackson 20 Apr (M. Hill); 1 at Seven Springs 8 May (K. Tracey); 5 in *Alachua* 18 May (J. Hintermister et al.).

American Avocet: up to 8 at SRSTF 5 Mar-21 Apr (G. Menk et al.); 1 at Newnans Lake to 19 Mar (A. Kent, L. Davis); 138 at PPM 23 Mar (P. Fellers et al.); 30 at Brandon 28 Mar (K. Tracey) and 17 there 28 Apr (E. Kwater); 2 at LARA 11-15 Apr (H. Robinson).

Greater Yellowlegs: 2 at LARA to 30 May (H. Robinson).

Lesser Yellowlegs: 129 at LARA 26 Apr, and 1 there 30 May (H. Robinson); 340 at Newnans Lake 29 Apr (J. Hintermister, M. Manetz et al.); 134 at TISP 3 May (R. Clark).

Solitary Sandpiper: up to 3 at Newnans Lake 19-30 Apr (L. Davis, J. Hintermister et al.); 2 at Seven Springs 8 May (K. Tracey); 1 at LARA 16 May (H. Robinson).

Willet: 1 at PPM 22 Apr (P. Timmer, C. Geanangel); 1 at Newnans Lake 7 May (L. Davis, R. Rowan).

Spotted Sandpiper: 4 at LARA to 16 May (H. Robinson); 35 at Newnans Lake 18 May (J. Hintermister, L. Davis et al.).

Upland Sandpiper: 1 at LARA 21-30 Mar and up to 3 there 26 Apr-4 May (H. Robinson); three small flocks at Lake Jackson 4 Apr (F. James) and 7 there 5 Apr (D. Houle); 3 in north-central *Pasco* 12 Apr (B. Pranty, S. Peacock, photos to FOC); 1 at DTNP 14-20 Apr (V. Lucas, C. Ewell); 1 leucistic individual in south-central *Pasco* 19 May (L. Walton, photos to FOC).

Whimbrel: 1 at Fort Pickens 22 Mar (T. Pratt); 1 at DTNP 15 Apr (L. Manfredi et al.); birds at Newnans Lake 17 Apr-13 May, with 15 there 26 Apr (M. Manetz, L. Davis et al.); 42 in *Escambia* 20 Apr (A. and D. Forster); 4 at HISRA 10 May (P. Blair); 1 at LARA 13 May (H. Robinson); 3 at Shell Key (*Pinellas*) 13 May and 2 there 31 May (both P. Blair, B. Hoffman); 6 at Anclote Keys (*Pasco*) 17 May (R. Paul, A. Schnapf et al.).

Long-billed Curlew: 4 at Alafia Bank 11 Mar (R. Paul, A. Schnapf et al.); 2 at Shell Key 22 Mar and 1 there to 25 May (P. Blair et al.); 1 at FDCP 5 May (P. Blair et al.); 1 at Three Rooker Bar (*Pinellas*) 17 May (R. Paul, A. Schnapf et al.).

Marbled Godwit: 40 in *Escambia* 20 Apr (A. and D. Forster).

Ruddy Turnstone: three singles at Newnans Lake variously during 1-27 May (R. Rowan et al.); 1 at LARA 16 May (H. Robinson).

Red Knot: 1 at LARA 3 Apr (H. Robinson); 300 at Shell Key 13 May (P. Blair, B. Hoffman).

Sanderling: up to 6 at Newnans Lake 23 Apr-21 May (B. Simons, L. Davis et al.); 1 at East Lake Tohopekaliga (*Osceola*) 6 May (L. Davis).

Semipalmated Sandpiper: 1 at SRSTF 14 Apr and 450 there 14 May (G. Menk et al.); 500 at Newnans Lake 27 May (J. Hintermister, L. Davis et al.); 1 at LARA to 27 May (H. Robinson).

Western Sandpiper: 3 at SRSTF 30 Mar (D. Harder, G. Menk); 1 at Newnans Lake 13 May (A. Kratter).

Least Sandpiper: 777 at Lake Hollingsworth, Lakeland (*Polk*) 21 Apr (B. and L. Cooper); 600 at Newnans Lake 23 Apr (L. Davis et al.).

White-rumped Sandpiper: 3 at HISRA 23 Apr (W. Yusek et al.); 20 at SRSTF 25 Apr (D. Harder); 31 at Newnans Lake 29 Apr (J. Hintermister, M. Manetz).

Baird's Sandpiper: 1 at SRSTF 27 Apr (J. Cavanagh).

Pectoral Sandpiper: 1 at LARA 27 Mar and 6 there 26 Apr (H. Robinson); 8 at Newnans Lake 1 Apr and 9 May (L. Davis, J. Hintermister et al.).

Purple Sandpiper: 1 at Gulf Breeze to 29 Mar (B. and L. Duncan et al.).

Dunlin: 16 at LARA 21 Mar (H. Robinson); up to 60 at Newnans Lake to 29 Mar (A. Kent, B. Simons).

Curlew Sandpiper: 1 in winter plumage at FWBSTF 12-15 Apr (B. Duncan et al., details to FOC).

Stilt Sandpiper: 36 at E Tampa (*Hillsborough*) 11 Mar (K. Tracey, B. Pranty); 15 at Newnans Lake 19-26 Mar (A. Kent, L. Davis et al.); 15 at Brandon 20 Mar (R. Webb) and 7 there 12 May (T. Mann et al.); 37 at LARA 11 Apr, and 1 there to 16 May (H. Robinson); 1426 at Lake Hollingsworth 21 Apr (B. and L. Cooper); 84 at TISP 3 May (R. Clark).

Buff-breasted Sandpiper: 2 at Lake Jackson 4 Apr (F. James).

Ruff: 1 at Newnans Lake to 10 Mar (A. Kent); 1 male at SRSTF 23 Mar-3 Apr (G. and S. Hampton et al.).

Short-billed Dowitcher: 2 at Newnans Lake 18 Apr (B. Muschlitz, H. Adams, M. Landsman); 276 at TISP 3 May (R. Clark).

Long-billed Dowitcher: 1295 at Lake Hollingsworth 21 Apr (B. and L. Cooper); 130 at Newnans Lake 23 Apr (L. Davis, R. Webb et al.); 50+ at Brandon 28 Apr (E. Kwater).

Wilson's Phalarope: 2 at Black Hammock Island *(Duval)* 13 May (R. Clark); 1 at Newnans Lake 17 May (L. Davis); 1 at LARA 27 May (H. Robinson).

Red-necked Phalarope: 1 within 6 km of DTNP 23 Apr (P. Lehman et al.); 2 at Merritt Island NWR (*Brevard*) 7 May (T. Rogers); singles at Newnans Lake 7 and 17 May (J. Bryan, L. Davis et al.); 1 at LARA 16 May (H. Robinson).

Parasitic Jaeger: 2 adults SW of Key West 24 Apr (P. Lehman et al.).

Long-tailed Jaeger: 1 immature at Fort Pickens 4 Apr (B. Duncan, details to FOC).
Franklin's Gull: 1 immature at Jaycee Park, Lake Okeechobee (*Okeechobee*) 23 Apr (T. Palmer).
Little Gull: 1 at Titusville 13 Apr (J. McManus).
Black-headed Gull: 1 at Newnans Lake to 4 May (B. Simons, L. Davis et al.).
Bonaparte's Gull: 1 at Lake Jackson 24 Apr (G. Menk); 1 at Newnans Lake 13 May (A. Kratter).
Ring-billed Gull: 1 worn immature at DTNP 25-26 Apr (P. Lehman et al.).
Great Black-backed Gull: 1 first-year bird at Tigertail Beach 15 Mar (K. Behrens).
Lesser Black-backed Gull: 4 adults at Huguenot Park (*Duval*) 15 Apr (R. Clark).
Black-legged Kittiwake: 1 at Key West (*Monroe*) 7 Mar (J. Ondrejko).
Gull-billed Tern: 28 at Four Corners phosphate mine *(Hillsborough* and *Polk) 25* Apr (P. Fellers); 1 at Jupiter Inlet 25 Apr (J. and L. Hailman); 1 at Brandon 28 Apr (E. Kwater); 2 at LARA 2 May (H. Robinson); 2 at Alafia Bank 19 May (R. Paul, A. Schnapf); 1 at Key Vista CP *(Pasco)* 24 May (K. Tracey); 1 at Newnans Lake 27 May (R. Rowan, L. Davis, M. Manetz).
Caspian Tern: 89 at LARA 19 Apr, and 1 there to 27 May (H. Robinson); 180 at PPM 25 Apr (P. Fellers); 5 at Newnans Lake 7 May (L. Davis, B. Simons et al.).
Royal Tern: 1 adult at Alafia Bank 3 Mar was pursued by a begging juvenile—post-fledging care is extremely long in this species (R. Paul, A. Schnapf); 12 at PPM 1 Apr (P. Timmer, C. Geanangel, D. McNair); 1 at Newnans Lake 9 Apr-9 May (L. Davis, J. Hintermister et al.).
Sandwich Tern: 9 at PPM 22 Apr (P. Timmer, C. Geanangel).
Roseate Tern: 1 on the beach at Jupiter Inlet 1-2 May (J. and L. Hailman).
Common Tern: 6 with "good carpal bars" at Three Rooker Bar 17 May (R. Paul, A. Schnapf et al.).
Arctic Tern: 1 adult found on Pompano Beach (*Broward*) 19 May later died (*fide* W. George, specimen to UCF).
Least Tern: 3 at Tallahassee 29 Mar, and 60 over a shopping center roof there 29 May (G. Menk).
Sooty Tern: 1 at Jupiter Inlet 31 May (J. and L. Hailman).
Black Tern: 1 at Titusville (*Brevard*) 28 Apr-3 May (P. Bowen et al.); 1 at LARA 21 May (H. Robinson).
Black Noddy: no birds this spring at DTNP (W. Biggs, S. Bass et al.); the report (*FFN* 27: 182-193) that birds were absent in spring 1999 was in error; birds were in fact present (S. Bass).
Black Skimmer: 120 at Lake Hollingsworth 21 Apr (B. and L. Cooper); 183 at Okeechobee 23 Apr (T. Palmer).
Mourning Dove: 1 leucistic bird at Naples (*Collier*) 27 May (V. Fitz-Gerald).
White-winged Dove: 1 at Gainesville 20 Mar (R. Burns); 1 at New Port Richey (*Pasco*) 9 Apr, and 2 there by 24 Apr (R. Seidel); 1 at DTNP 14 Apr (V. Lucas); 1 at St. George Island (*Franklin*) 25 Apr (J. Cavanagh); 1 at Sanibel Lighthouse (*Lee*) 25 Apr (V. Lucas); 2 at Lutz (*Pasco*) in late Apr (D. Bowman); 4 at Brandon 28 Apr (E. Kwater); 1 at Cape Coral (*Lee*) 27 May (C. Ewell, V. Fitz-Gerald); 1 near the Palm River (*Hillsborough*) all spring (R. Paul).
Masked Lovebird: 1 at a Monk Parakeet nest at North Shore Park, St. Petersburg (*Pinellas*) 9 Apr (R. Wallace).
Monk Parakeet: 1 nest at Bayshore Gardens 11 Mar was built just under a Great Blue Heron nest (R. Paul).
Mitred Parakeet: 1 at Gainesville has been observed the past three years (R. Rowan).
Blue-crowned Parakeet: 2 at Anna Maria Island (*Manatee*) 1 May (J. Bouton).
Smooth-billed Ani: 1 at Bahia Honda SP (*Monroe*) 16 Mar (G. and J. Halleron); 1 at St. Lucie Canal (*Martin*) 23 May (B. and L. Cooper).

GROOVE-BILLED ANI: 1 at Ocklawaha Prairie Restoration Area (*Marion*) 23 Mar ff (E. Scales, R. Langer).

BARN OWL: 4 nestlings in a deer stand in central *Pasco* 13 Apr (B. Pranty [photos to FOC], S. Peacock).

SHORT-EARED OWL: 2 W of Kendall (*Miami-Dade*) remained to 1 Mar (J. Boyd); 1 at LARA to 25 Mar (H. Robinson); 2 at DTNP 12 Apr (W. Biggs et al.), and 1-2 there to 25 Apr (P. Lehman et al.).

WHIP-POOR-WILL: 1 calling in N *St. Johns* 14 Mar (P. Powell).

LESSER NIGHTHAWK: 1 at DTNP 7 May (K. Radamaker, M. Patten et al., details to FOC).

*VAUX'S SWIFT: 2 at Fort Pickens 18 Apr (B. Duncan, details to FOC).

BUFF-BELLIED HUMMINGBIRD: 1 at Pensacola (*Escambia*) 8 Apr (J. Williams).

BLACK-CHINNED HUMMINGBIRD: 1 at Gainesville to 10 Mar (D. Beatty); single males at Tallahassee 10 Mar (P. Conover) and 19 Mar (J. O'Malley); 1 "very fat" female at Key West 8 Apr (J. Ondrejko).

*CALLIOPE HUMMINGBIRD: 1 immature male at Pensacola to 2 Mar (L. Duncan et al.).

RED-HEADED WOODPECKER: 1 at HISRA 11 Apr (W. Yusek); 1 at FDCP 15 Apr (*fide* R. Smith).

HAIRY WOODPECKER; 1 female at Sanibel Lighthouse 2 Apr (V. McGrath).

EASTERN WOOD-PEWEE: 1 calling at Shady Hills (*Pasco*) 10 Mar (D. Robinson); 1 at FDCP 4 Apr (R. Webb); 1 at Matheson Hammock CP (*Miami-Dade*) 29 Apr (J. Boyd et al.).

ACADIAN FLYCATCHER: 2 in *Wakulla* 1 Apr (J. Epler); 1 at San Felasco Hammock State Preserve (*Alachua*) 8 Apr (H. Adams, C. Parenteau).

LEAST FLYCATCHER: 1 at FDCP remained to 11 Apr (R. Smith, B. Ahern et al.).

VERMILION FLYCATCHER: 1 female at Micanopy *(Alachua)* to 7 Mar (R. Rowan).

ASH-THROATED FLYCATCHER: 1 at Emeralda Marsh Conservation Area 3-11 Mar (P. May, photo to FOC); 1 near LARA 21 Mar (C. and K. Radamaker); 1 at FWBSTF to 5 Apr (B. and L. Duncan et al.).

GREAT CRESTED FLYCATCHER: 1 at Lower Suwannee NWR (*Levy*) 7 Mar (A. Kratter).

BROWN-CRESTED FLYCATCHER: 1 at Everglades NP through 13 Mar (L. Manfredi et al.).

LA SAGRA'S FLYCATCHER: 1 at Hugh Taylor Birch SP (*Broward*) 16 Apr (W. George, S. Epps et al.); 1 at Upper Key Largo 21 Apr (A. Binns).

*TROPICAL/COUCH'S KINGSBIRD: 1 at FDCP 16 Apr (S. Backes); 1 at Gulf Breeze 16 May (J. Peaden, B. and L. Duncan, details to FOC).

WESTERN KINGBIRD: 30 at LARA 10 Mar, and 1 there to 16 May (H. Robinson); 4 near the SE shore of Lake Istokpoga (*Highlands*) 14 Mar (M. McMillian); 1 at FDCP 6 Apr (L. Atherton), 1 at FWBSTF 29 Apr (B. Duncan, B. and P. Tetlow).

*CASSIN'S KINGBIRD: 1 at LARA to 26 Apr (H. Robinson).

GRAY KINGBIRD: 1 at LARA 6 Apr (H. Robinson); 16 at Cedar Key 24 Apr (T. Rogers).

SCISSOR-TAILED FLYCATCHER: 1 in *Suwannee* 7-16 Mar (A. Kropp); 2 near the SE shore of Lake Istokpoga 14 Mar (M. McMillian); 1 at LARA to 30 Mar (H. Robinson); 2 at Okeechobee 6 Apr (P. Poe); singles at FDCP 7-10 Apr, 12 Apr, and 15 Apr (L. Atherton et al.); 1 at Seven Springs to 12 Apr (D. Wassmer, L. Saul); 1 at SMNWR 20 Apr (D. and J. Wright); 1 at Cedar Key 26 Apr (D. Henderson); 1 at Starkey Wilderness Park (*Pasco*) 28 Apr (K. Tracey, photos to FOC); 1 at Crystal River State Buffer Preserve 29 Apr (T. Rogers); 1 short-tailed bird at Blue Mountain Beach 17 May (T. Striker).

FORK-TAILED FLYCATCHER: 1 immature at Boot Key (*Monroe*) 3 May (J. Gordon et al.); 1 at DTNP 3-4 May (S. Bass et al.).

YELLOW-THROATED VIREO: 1 at FDCP 11 Mar (R. Smith, B. Hoffman); 1 singing at Starkey Wilderness Park 13 Mar (K. Tracey); 6 at Crystal River 19 Mar (T. Rogers); 1 at LARA 21 Mar (H. Robinson).

WARBLING VIREO: 1 at Fort Pickens 25 Apr (L. Duncan et al.).

PHILADELPHIA VIREO: 1 at FDCP 27-29 Apr (*fide* R. Smith).

RED-EYED VIREO: 3 at San Felasco Hammock State Preserve 12 Mar (M. Manetz, A. Kent).

Black-whiskered Vireo: 1 at SMNWR 23 Apr (D. and J. Wright); 1 at FDCP 29 Apr-2 May (P. Blair, W. Yusek et al.); 1 at Belleair Beach (*Pinellas*) 9 May (J. Fisher).

Tree Swallow: 1 at LARA to 27 May (H. Robinson).

Northern Rough-winged Swallow: 2 at SRSTF S Mar and 4 there 10 Mar (both G. Menk); 2 pairs nesting in drain pipes at Seven Springs Middle School (*Pasco*) 6 Apr (K. and L. Tracey et al.).

Cliff Swallow: 1 at SRSTF 27 Mar (G. and S. Hampton) and 2 there 6 Apr (D. Harder, G. Menk); 2 at Crews Lake CP 28 Mar (D. Robinson); singles at Sanibel Lighthouse 4 Apr, 8 Apr, and 22 Apr (V. McGrath); 1 at FDCP 10 Apr (L. Atherton); 1 at LARA 30 Apr (H. Robinson).

Cave Swallow: 1 at St. George Island 20 Mar (J. Cavanagh); 1 at Tram Road STF (*Leon*) 6 Apr (D. Harder, G. Menk); 1 at FWBSTF 14-15 Apr (M. and R. Rose, B. Duncan et al., details to FOC); 1 at DTNP 17-19 and 3 there 25 Apr (P. Lehman et al.). One of the birds on the latter date had a "fairly pale rusty-buff rump (close to that of a typical Cliff) and dull grayish-white sides" (P. Lehman et al.).

Barn Swallow: singles at SRSTF 10 Mar (G. Menk) and 12 Mar (G. and S. Hampton); 4 at FDCP 12 Mar (B. and L. Atherton); 1 at Shell Key 31 May (P. Blair).

Red-breasted Nuthatch: 1 at Gainesville 22-23 Mar (A. Kratter, R. Rowan); 1 at Cedar Key 6 Apr (J. Hintermister).

Carolina Wren: 1 adult feeding a fledgling at Spring Hill (*Hernando*) 22 Mar (A. and B. Hansen).

*Bewick's Wren: 1 at FWBSTF 9 Mar (L. Duncan et al., details to FOC); 1 at LARA 14 Mar (H. Robinson).

House Wren: 1 at LARA to 2 May (H. Robinson).

Winter Wren: 1 at San Luis Mission Park (*Leon*) 6 Mar (G Menk).

Sedge Wren: 41 at LARA 3 Apr (H. Robinson).

Marsh Wren: 61 at LARA 15 Apr, and 1 to 13 May (H. Robinson).

Golden-crowned Kinglet: 1 at Manatee Springs SP (*Levy*) 3 Mar (R. Hoyer et al.); 1 at Lower Suwannee NWR 7 Mar (A. Kratter).

Eastern Bluebird: 1 at FDCP 6 May (N. Ogden et al.).

Veery: 1 in *Wakulla* 19 Apr (D. Harder); 4 in *Alachua* variously 23 Apr-3 May (P. Burns, A. Kratter); 1 singing at Key West 22 Apr (J. Ondrejko); 15+ at Cedar Key 26 Apr (T. Hoctor).

Gray-cheeked Thrush: 1 at SMNWR 23 Apr (D. Morrow); 1 at Gainesville 26 Apr (A. Kratter); 1 at Newnans Lake 27 Apr (R. Rowan, T. Hoctor).

*Bicknell's Thrush: 1 possible bird at Sugarloaf Key 26 Apr (P. Hockey, details to FOC); 1 at LARA 27 May (H. Robinson).

Swainson's Thrush: 1 singing at San Luis Mission Park 29 Apr (D. Harder); 1 at Gainesville 30 Apr (A. Kratter).

Wood Thrush: singles at FDCP 23 Mar (L. Atherton et al.) and 23 Apr (L. Walton, C. Dermer, B. Pranty et al.); singles at Sanibel Lighthouse 4 Apr and 25-30 Apr (V. McGrath et al.); singles at Captiva Island (*Lee*) 4 Apr and 4 May (V McGrath); singles at Bonner Park (*Pinellas*) 8 Apr and 1 May (J. Fisher); 1 singing at Key West 21 Apr (J. Ondrejko); 3 at HISRA 23 Apr (W. Yusek et al.); 3 at Gainesville variously 26-30 Apr (A. Kratter, J. Hintermister); 1 at Turkey Creek Sanctuary 30 Apr-1 May (B. and S. Hills).

Gray Catbird: 31 at Bonner Park 21 Apr (J. Fisher); 100+ at FDCP 23 Apr (B. Pranty et al.); "literally hundreds" at Cedar Key 26 Apr (D. Henderson); 1 at Gainesville 27 May-EOS (R. Rowan).

Bahama Mockingbird: 1 at DTNP 12 Apr (W. Biggs et al.); 1 at Matheson Hammock CP 12 May (L. Manfredi, J. Boyd et al., photo to FOC by A. and T. Mason).

Brown Thrasher: 1 at Key West 26-29 Mar (J. Ondrejko); 1 at DTNP 17-19 Apr (P. Lehman et al.); 9 at HISRA 23 Apr (W. Yusek et al.).

CEDAR WAXWING: 50 at Hernando Beach 7 May (K. Nelson, P. Blair, L. Hopkins); 49 at LARA 13 May (H. Robinson).

BLUE-WINGED WARBLER: single males at Sanibel Lighthouse 9 Apr (V. McGrath) and 23-29 Apr (D. Konz et al.); singles at Cedar Key 15 Apr (R. Rowan) and 26 Apr (T. Hoctor); 1 at Birch SP 23-25 Apr (J. DiPasquale et al.); 1 at FDCP 20 Mar (K. Allen et al.), 2 there 8 Apr (*fide* R. Smith), and 1 there 23-25 Apr (B. Pranty, E. Kwater et al.); 1 at Bonner Park 15 Apr (J. Fisher).

GOLDEN-WINGED WARBLER: 1 male at FDCP 25 Apr (E. Kwater, C. Kelsey); 1 male at DTNP 25 Apr (P. Lehman et al.); 1 female at Sanibel Lighthouse 25-27 Apr (V. Lucas, D. Konz); 1 at Cedar Key 29 Apr (D. Henderson).

TENNESSEE WARBLER: 1 at Sanibel Lighthouse 4 Apr, and 2 there 25-26 Apr (V. Lucas); 1 at Cedar Key 15 Apr (E. Bonahue, R. Rowan); 3 at FDCP 23 Apr (B. Pranty, C. Dermer, L. Walton); 1 at Tallahassee 30 Apr (P. Conover).

ORANGE-CROWNED WARBLER: 1 at DTNP 17-19 Apr (P. Lehman et al.).

NASHVILLE WARBLER: 1 at Turkey Creek Sanctuary through 10 Mar (B. and S. Hills); 1 at Birch SP 21-25 Apr (S. Epps et al.); 1 W of Kendall 24 Apr (J. Boyd); 1 at HISRA 25 Apr (M. DelGrosso).

YELLOW WARBLER: 1 male at Winter Haven (*Polk*) 23 Apr (P. Fellers); 2 at FDCP 25 Apr (E. Kwater, C. Kelsey); 1 at Newnans Lake 27 Apr (A. Kratter, T. Hoctor).

CHESTNUT-SIDED WARBLER: 1 at Cedar Key 22 Apr (D. Henderson); 1 adult male at FDCP 23 Apr (S. Backes, B. Pranty et al.); up to 12 at Sanibel Lighthouse 23 Apr-3 May (V. McGrath et al.); 1 male at San Luis Mission Park 1 May (D. Harder).

MAGNOLIA WARBLER: 1 at Bartow 23 Mar (P. Fellers); 3 at Gainesville variously 20 Apr-13 May (N. Rowan, A. Kratter, D. Beatty); 6 at Sanibel Lighthouse 25 Apr (V. McGrath, W. Winton); 1 singing male 25 Apr at Winter Haven (P. Fellers).

CAPE MAY WARBLER: 1 male HISRA 31 Mar (E. Kwater).

YELLOW-RUMPED WARBLER: 1 at Paynes Prairie State Preserve (*Alachua*) 6 May (R. Rowan, H. Adams); 1 at Washington Oaks SP (*Flagler*) 21 May (A. Kratter).

BLACK-THROATED GREEN WARBLER: 1 singing at Tallahassee 27 Mar (J. Cavanagh); up to 3 at Sanibel Lighthouse 25-30 Apr (V. McGrath, W. Winton et al.).

TOWNSEND'S WARBLER: 1 at MINWR to 2 Apr (B. and R. Karnofsky et al., photo to FOC by L. Snyder).

BLACKBURNIAN WARBLER: 3 at FDCP 25 Apr (E. Kwater, C. Kelsey et al.); 1 at Sanibel Lighthouse 25-30 Apr (V. McGrath et al.); singles at Cedar Key 26 Apr and 8 May (T. Hoctor, C. Graham).

PRAIRIE WARBLER: 6 males singing at Anclote and Dutchman Keys 17 May, and 10 singing at Tarpon Key (*Pinellas*) 24 May (both R. Paul, A. Schnapf et al.).

PALM WARBLER: 1 *hypochrysea* at Tallahassee 12 Apr (D. Harder); 1 at Paynes Prairie State Preserve 13 May (R. Rowan, H. Adams).

BAY-BREASTED WARBLER: up to 5 males and 1 female at Sanibel Lighthouse 23-30 Apr (V. McGrath et al.); 1 adult male at FDCP 23 Apr (L. Walton, B. Pranty et al.); 1 at Key Vista CP 23 Apr (K. Tracey); 1 at St. George Island 28 Apr (J. Cavanagh).

BAY-BREASTED × BLACKPOLL WARBLER: 1 apparent hybrid of this type at DTNP 22 Apr (P. Lehman et al.); 5 variously at Cedar Key 22-29 Apr (D. Henderson).

BLACKPOLL WARBLER: 1 at Monticello (*Jefferson*) 6 Apr (R. Atchison); 1 at North Anclote Key (*Pasco*) 17 May (R. Paul, A. Schnapf et al.).

CERULEAN WARBLER: 1 female at Bonner Park 22 Apr (K. Nelson); 1 female at DTNP 22 Apr (P. Lehman et al.); 3 males and 2 females at FDCP 25 Apr (*fide* R. Smith); 2 females at Sanibel Lighthouse 25-30 Apr (V. McGrath et al.); 1 at Cedar Key 26 Apr (D. Henderson).

AMERICAN REDSTART: 1 that wintered at Gainesville remained to 16 Apr (M. Manetz); 1 that wintered at Turkey Creek Sanctuary remained to 1 Apr (B. and S. Hills).

PROTHONOTARY WARBLER: 1 at Lettuce Lake CP 12 Mar (R. Webb); 1 in SW *Pasco* 9 Apr (K. Tracey); 5 at FDCP 23 Apr (B. Pranty et al.).

Worm-eating Warbler: 1 at FDCP 20 Mar (A. Smith); singles at SMNWR 31 Mar (N. and P. Biefield) and 8 Apr (T. Kennedy, H. Horne); 1 at Starkey Wilderness Park 12 Apr (K. and L. Tracey).

Swainson's Warbler: birds at Fort Lauderdale 29 Mar-28 Apr, with 3 at Birch SP on the latter date (W. George et al.); singles at FDCP 24 and 28 Mar, 8 there 12 Apr, and 1 there to 2 May (L. Atherton et al.); 1 at Seminole (*Pinellas*) 30 Mar-3 Apr (J. Fisher); 1 at Largo (*Pinellas*) 10 Apr (J. Fisher); 1 at Gainesville 12 Apr (M. Meisenburg); 2 at Cedar Key 13-16 Apr (D. Henderson, C. Graham); 2 at Bonner Park 14 Apr and 1 there 21-22 Apr (both J. Fisher); 1 at DTNP 14 Apr (L. Manfredi, V. Lucas); 1 at Sanibel Lighthouse 27-30 Apr (D. Beeler et al.); 1 at Steinhatchee Springs WMA (*Lafayette*) 19 May (B. Muschlitz).

Northern Waterthrush: 1 at Lower Suwannee NWR 3 Mar (R. Hoyer et al.); 1 at FDCP 23 Mar (L. Atherton et al.); 1 at SMNWR 26 Mar (T. Curtis); up to 4 at Black Swamp (*Leon*) 27 Apr (G. Menk, D. Harder); 11 at LARA 26-30 Apr, and 1 there to 13 May (H. Robinson); 1 at Newnans Lake 18 May (R. Rowan).

Louisiana Waterthrush: 1 at Manatee Springs SP 3 Mar (R. Hoyer et al.); 1 at HISRA 10 Mar (W. Yusek); 1 at Paynes Prairie State Preserve 11 Mar (M. Meisenburg, R. Rowan); 1 at Sanibel Lighthouse 8 Apr (C. Ewell et al.); 1 at Black Swamp 10 Apr (D. Harder); 1 at LARA to 19 Apr (H. Robinson); 1 at Indigenous Park, Key West 21-23 Apr (C. Ewell, C. Borg); 1 at Tall Timbers Research Station (*Leon*) 6 May (T. Engstrom).

Kentucky Warbler: 1 at FDCP 28 Mar (L. Atherton et al.), 10+ there 23 Apr (B. Pranty, C. Dermer, L. Walton et al.), and 12+ there 25 Apr (E. Kwater et al.); 1 at Key West 28 Mar-21 Apr (J. Ondrejko); 2 males at Sanibel Lighthouse 1-9 Apr, and up to 2 males and 1 female there 25 Apr-2 May (C. Ewell, V. McGrath); 1 at DTNP 20-22 Apr (L. Manfredi, C. Ewell et al.); 1 male at Indigenous Park 23 Apr (C. Ewell, A. Salcedo).

Connecticut Warbler: 1 at FDCP 1 May (L. Atherton); 1 at Bonner Park 5-6 May (J. Fisher, M. Wilkinson); 1 at Birch SP 18 May (W. George).

Hooded Warbler: 1 at San Felasco Hammock State Preserve 17 Mar (K. Miller); 10 at FDCP 20 Mar (K. Allen et al.).

Wilson's Warbler: 1 male at San Luis Mission Park to 12 Mar (G. Menk, D. Harder et al.); 1 at Birch SP 19 Mar (W. George); 1 male that wintered at S Jacksonville remained to 20 Mar (P. Powell); 1 that wintered at Newnans Lake remained to 24 Mar (R. Rowan); 1 male at Key West 16 Apr (P. Lehman et al.).

Yellow-breasted Chat: 1 that wintered at ENP (*Miami-Dade*) remained to 4 Mar (J. Boyd); 1 at Gulf Hammock (*Levy*) 28 Mar (S. Lowrimore); 2 males singing at Crystal River State Buffer Preserve 29 Apr-EOS (T. Rogers et al.) and 15 May-EOS (A. and B. Hansen et al.); 4 at Paynes Prairie State Preserve 13 May (H. Adams, M. Meisenburg et al.); 1 at San Felasco Hammock State Preserve 22 May (D. Simpson); 19 males singing at LARA through the spring, with 8 on 30 May (H. Robinson).

Summer Tanager: 1 at Gainesville 21 Mar (A. Kratter).

Scarlet Tanager: 5 at San Luis Mission Park 23 Apr (D. Harder) and 6 there 29 Apr (G. Menk).

Western Tanager: 1 female at Cedar Key 22 Apr (B. Muschlitz).

*Yellow-faced Grassquit: 1 at Loggerhead Key, DTNP 9 May (K. Knight et al., sketch to FOC).

Chipping Sparrow: 1 at Monticello 19 Apr (R. Atchison).

Field Sparrow: 3 at LARA to 21 Mar (H. Robinson).

Vesper Sparrow: 12 at LARA 10 Mar, and 1 there to 18 Mar (H. Robinson).

Lark Sparrow: 1 adult male at Melbourne (*Brevard*) 24 Mar (L. Jaquays); 1 at FDCP 15 Apr (J. and L. Hopkins et al.); 1 at DTNP 17-19 Apr (P. Lehman et al.).

Savannah Sparrow: up to 12 W of Kendall to 15 Apr (J. Boyd, photos to FOC); 12 at LARA 30 Apr, and 1 there to 30 May (H. Robinson).

GRASSHOPPER SPARROW: 1 at Turkey Creek Sanctuary 24 Mar (B. and S. Hills); up to 4 W of Kendall to 2 Apr (J. Boyd, photos to FOC); 1 at FDCP 8 Apr (A. and R. Smith, L. Atherton et al.); 1 at SRSTF 23 Apr (A. and K. Kropp).

LE CONTE'S SPARROW: 6 observations al Buck Island Ranch late Jan-early Mar (M. McMillian); 1 near the Alafia River (*Hillsborough*) 24 Mar (R. Paul).

NELSON'S SHARP-TAILED SPARROW: 5 at Shell Key 22 Mar (P. Blair).

SONG SPARROW: 1 at Tall Timbers Research Station 6 May (T. Engstrom).

LINCOLN'S SPARROW: 1 at Fort Pickens 2-23 Mar (T. Pratt, M. Rose et al.); 1 at LARA 14 Mar (H. Robinson); 1 at Birch SP 27 Apr was the first for the park (W. George).

SWAMP SPARROW: 1 at LARA to 7 May (H. Robinson).

WHITE-CROWNED SPARROW: 9 at LARA 3 Apr (H. Robinson).

DARK-EYED JUNCO: 1 at Kanapaha Prairie (*Alachua*) to 1 Mar (E. Perry); 1 at Gainesville to 16 Mar (D. Beatty).

ROSE-BREASTED GROSBEAK: 10 at FDCP 22-23 Apr (*fide* R. Smith, B. Pranty et al.); 5 singles variously at Jacksonville 24 Apr (*fide* P. Powell); 12 at Gainesville variously in the latter half of Apr (R. Rowan, M. Manetz et al.).

BLUE GROSBEAK: 20 at Cedar Key 24 Apr (T. Rogers); 59 males singing at LARA through the spring, with 24 on 21 May (H. Robinson).

INDIGO BUNTING: 1 "blotchy" male at Monticello 17 Mar (R. Atchison); 1 at Gainesville 18 Mar (M. Manetz); "probably several hundred" at FDCP 22 Apr (B. Hoffman et al.); 24 at Cedar Key 24 Apr (T. Rogers); 32 males singing at LARA through the spring, with 28 on 30 Apr (H. Robinson).

PAINTED BUNTING: 1 at Hague Dairy (*Alachua*) to 11 Mar (P. Burns); up to 3 males at FDCP 5-12 Apr (*fide* R. Smith); 1 male at Weeki Wachee (*Hernando*) 11-16 Apr, and a female there 20-23 Apr (both C. Black); 1 in *Leon* 12 Apr (C. Schneider); 3 in mid *Pinellas* 15 Apr (1. Fisher); 1 male at HISRA 25 Apr (R. Webb); 9 males singing (2 adults and 7 immatures) at LARA through the spring (H. Robinson).

DICKCISSEL: 1 at DTNP 20 Apr (C. Ewell et al.); up to 8 (7 males) at SRSTF 23 Apr-13 May (G. Menk, D. and K. MacVicar et al.); 1 male at Sanibel Lighthouse 25-26 Apr (W. Winton, V. Lucas); 1 male in *Pinellas* 27 Apr (J. Fisher); 1 male at FDCP 28 Apr (P. Blair, W. Yusek et al.); 9 (1 female and 8 males) at LARA 30 Apr-EOS (H. Robinson, K. Knight et al.); 1 male at Bald Point (*Franklin*) 24 May (J. Dozier).

BOBOLINK: 3140 at LARA 30 Apr, and 3 there to 23 May (H. Robinson); 19 at Seven Springs 8 May (K. Tracey).

YELLOW-HEADED BLACKBIRD: 1 adult male at Busch Gardens (*Hillsborough*) 6 Mar (B. Ahern).

RUSTY BLACKBIRD: 5 at Black Swamp 3 Mar (D. Harder); 2 at Micanopy to 7 Mar (R. Rowan).

BREWER'S BLACKBIRD: 1 at Fort Pickens 16 Mar (B. Bremser).

BOAT-TAILED GRACKLE: 1 of the *torreyi* subspecies at Gainesville 4 Mar (R. Rowan).

SHINY COWBIRD: 1 male at Micanopy 31 Mar (E. Tillman, A. Cheadle, specimen to FLMNH); 1 at Cedar Key 13-26 Apr (J. Skemp, T. Hoctor); 2 at DTNP 18-19 Apr, singles there 23 Apr and 24-25 Apr (P. Lehman et al.), and 8 females there 28 Apr (P. Hockey); 2 females at Sugarloaf Key (*Monroe*) 26 Apr (P. Hockey); 1 male singing at Al-Bar Ranch (*Pasco*) 5 May (B. Pranty, S. Peacock); 1 female at Jupiter Inlet 11 May (J. and L. Hailman); 2 males and 1 female at Flamingo, ENP 25 May (R. Webb); 1 male at Bald Point 29 May, joined by 1 female 30 May (both J. Dozier); 5 at Key West all spring (J. Ondrejko).

BRONZED COWBIRD: 1 at Panacea (*Wakulla*) 23 Apr (P. Conover).

ORCHARD ORIOLE: 1 at FDCP 22 Mar (K. Allen et al.); 7 in SW *Pasco* 9 Apr (K. Tracey); 1 immature male singing at LARA 21 May-EOS (H. Robinson).

BALTIMORE ORIOLE: single males at HISRA 28 Mar (W. Yusek) and 22 Apr (C. Buhrman, A. Turner).

House Finch: a pair at Chiefland (*Levy*) 20 Apr (R. Rowan); birds present at Williston (*Levy*) for "at least five years" (S. Lowrimore); 2 males singing ca. 4 km apart at Fort Lauderdale late May-9 Jun (W. George, S Epps).
Pine Siskin: 1 at Tallahassee 18-19 May (B. Scott).
House Sparrow: 1 female and 1 male at DTNP 24-30 Apr (P. Lehman, L. Manfredi et al.).
Zebra Finch: 3, including 2 that built a nest, at Bayonet Point (*Pasco*) 24 Apr ff (J. Wags, photo to FOC).

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EDITORIAL

This is the last issue of the *Florida Field Naturalist* that I will serve as editor. I am particularly appreciative of help provided by the following people: Kaye Gainey, administrative assistant at Tall Timbers Research Station, was a pillar of organization and support in all phases of editorial activity; Bobby Crawford was an invaluable sounding board in difficult decisions and a "pinch-hit" reviewer; former editors, Fred Lohrer and Walter K. Taylor made timely thoughtful suggestions; and former editor and now chair of the Florida Ornithological Society Editorial Advisory Committee, Peter Merritt, reviewed the "Guidelines for Contributors"; Jeffrey Johnston of the E. O. Painter Printing Company was very helpful in all ways during the printing of the *Florida Field Naturalist*. The peer review process is sometimes slow and circuitous, and I am deeply grateful to the authors for their patience and the many reviewers of manuscripts.

Those who reviewed manuscripts for this volume are listed below. Individuals who reviewed more than one manuscript are denoted with an asterisk.

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The *Florida Field Naturalist* is a fully refereed journal emphasizing biological field studies and observations of vertebrates, especially birds, in and near Florida and the nearby West Indies. It welcomes submission of manuscripts containing new information from these areas. Please consult recent issues for style and Vol. 27, No. 1 for detailed information. Submit manuscripts for consideration to the Editor, Jerome Jackson. Monograph-length manuscripts may be submitted for consideration to the Editor of Special Publications, Glen E. Woolfenden. Send books and other materials for review to Associate Editor, Reed Bowman. For preliminary assistance regarding submission of manuscripts dealing with bird distribution and rarities contact Associate Editor, Bruce H. Anderson. Reports of rare birds in Florida should also be submitted to the FOS Records Committee Secretary, Bruce H. Anderson.

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